FANTASTIC UNIVERSE SCIENCE FICTION

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by WYNNE WHITEFORD

■

SURVIVAL IN SPACE — An Article by LESTER DEL REY

CLARK ASHTON SMITH ■ STANLEY MULLEN ■ LEE CHAYTOR

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INTERVIEW WITH A HERO

I saw Medusa.

I was on that flight to Orion XVII a year ago. I see you remember. Yes, that was the flight that turned up at Deseret, days overdue, with one man sitting frozen at the controls—one badly frightened man who had operated mostly by instinct and survived because some of these ships seem to *know* where their home port is. . . . He was frantic when they tried to pry him loose from controls, frantic and blank-eyed when they asked him what had happened to the others on the ship, screaming hysterically about "The eyes! The eyes!"

That was me.

I am really much better now.

Yes, yes, I'll tell you what happened. We had a perfect landing, with Carter at the controls. Once Smith had run a series of tests he announced the air was safe, the three of us decided to go out to explore. Smith stayed behind.

When I think of it now, there was an evil quality to the lushness of the country around us, an evil quality that we did not sense at first, fascinated as we were by the almost tropical richness of the forest we soon found ourselves in. Forest? No, jungle! There were fantastic flowers in the shadows in this jungle, fantastic man-sized flowers that seemed to have a life of their own; Herb Young insisted, a little shakily, that one of these purple lilies, as we called them for want of a better name, had reached out to him and almost caressed him. Carter snorted something about space sickness, and we pushed on. . . .

Be patient! I'm coming to her. . . .

We struggled on for hours. There never seemed to be an end to this infernal cloying green *goo* that seemed to reach out at us—that seemed to grasp at us with its slimy green tentacles—a cloying mass of green that seemed to whisper to you that everything would be fine if you'd only rest a little, rest on the soft green moss under the nearby trees—or what passed for trees, rest and let the lillies around you lean over you and give you a little of the shade you were panting for. . . .

We turned back. We'd told Smith to fire his gun if we weren't back after some hours—or if he had trouble. There was the sound of a shot behind us—half blotted out by the trees and the flowers and the very air around us—and we turned back.

The return was agony. Both of the youngsters collapsed at one point, and I had to shout at them, to rave at them, to curse them into staggering to their feet and plunging on, staggering blindly back down the path we'd hewn hours earlier.

Finally we reached the ship, to find Smith standing in front—no, crouched, really—his frightened, sightless eyes staring into space. He was all stone.

The two boys rushed ahead of me as we neared the ship—and were bending over him when SHE laughed. . . .

They say I have been mad, and perhaps they are right, but I swear to you that I saw HER sitting there on a rock, clad in some blue thing that resembled the dress my wife had worn the night before we blasted off, the snakes crawling out of that head of her's. . . . She had her hands to her head, in that familiar gesture as old as Time when a woman sees a man, and she was laughing, a tinkling cymbal-like laugh that sent shivers down my back. . . . And there those poor young fools stood, turned into stone.

I seem to remember her beginning to turn as she heard my scream. I ran like all hell was behind me—ran for the shelter of the waiting ship—ran to where I could crouch, shaking and sobbing, over the waiting controls . . . .

Must you go? Will you do me a favor, please? Could you go to see my wife, please? I haven't seen her for so long. . . . The name is Mary Carter. . . .

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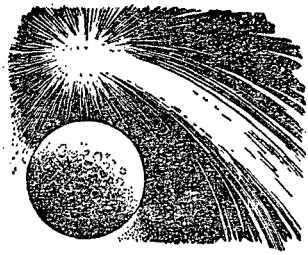

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operation disaster

by . . . Lee Chaytor

The one alternative to a grim and ugly death for what remained of their world, was to take this fantastic step.

THERE were only four persons left in The Hole. Steve Vannevar, the aeronautics expert, was one; and his beautiful wife Grace, whose work with the algae tanks had kept the scientists alive after the frozen and packaged food supplies gave out, was another. Dan Conroy, the red-haired, explosive electronics wizard was the third. The fourth was Telford Lowe, who had wrung and twisted his brain until it yielded up the mathematical equations necessary to put a protective shell of force around the ships—and then slipped quietly into a world of complete unreality, while the others sweated out a working prototype.

That was five years ago, when there were still more than twenty scientists and technicians in The Hole, and while the corridors still echoed to the sounds of men at work. Now there was Telford Lowe, wandering around whispering to himself, thanking Grace with a gentle smile when she fed him; and the other three, near the breaking point in their frenzied, last-ditch attempt to conquer space and time. . . . With ever the threat of the flesh-hungry savages on the prowl above their heads, and alarm signals which didn't always work.

Californian Lee Chaytor, who'll be remembered for her sensitive story, UGLY EARTHLING, *which appeared in our Feb. 1957 issue, and for her startling* BAIT FOR THE TIGER *(FU, May 1957), returns with this story of the desperate gamble of a group of dedicated men and women to save a world that is in flames.*

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The four scientists were safe enough as long as they stayed underground in that elaborate, pitiful fortress-shelter they and men like them had made to hold back the death of civilization. Safe, and comfortable enough—if breathing air that stank of its thousand times of use, drinking water whose purifying chemicals corroded the tongue, eating capsule rations from which the very memory of flavor had departed,—if these things were comforts, the scientists in The Hole had them. They had lived underground twenty years. The Hole was like a space ship, even to its air-lock entrances, self-contained and self-sufficient. But there were times when the desire to see the stars, to feel the sweet lifting wind and the warmth of sunlight on pallid flesh grew so strong that one of them would slip quietly away up the long, baffle-marked passageway. Sometimes he would come back. Oftener not. The rest worked on, grimly.

It was the twentieth year of the Hot War. The push button, guided missile war. Nation struck against nation in a frenzy of terror and revenge. Governments were destroyed, records lost; no one knew or cared who had launched the first treacherous blow. Readings of the radiation counters concealed above ground told them that no one had yet fired the ultimate bomb. Lying awake during his sleep-period, Steve Vannevar often wondered why not. Each side had at least one J-bomb, maybe more. And so little was left of the sane, ordered world as man had known it, that it was a miracle some crazed warlord had not sanctioned the hurling of the bomb which would atomize the earth. But perhaps the bombs were buried now beneath the rubble of cities, or forgotten in underground arsenals. Or perhaps fear of personal extinction prevented the irrevocable step. In the Atomic Age, even a blood-crazed brute could visualize and fear a total chain reaction.

Now it was F-day. Finality. The End. Finis. The last of the saucer ships sat in her launching cradle, waiting to make the impossible trip. Steve Vannevar leaned heavily against the work-bench, staring at the shining disc on which rode humanity's last chance of survival. Lowe's force-shell, a protective device, had had one of those amazing second effects more valuable than the desired primary use. In some incalculable way, it provided an increasing acceleration for the ship within its sphere, so that the rockets were necessary only for manoeuvering around planets. Theoretically, it could attain better than twice the speed of light.

Steve rubbed his aching eyes with hands that trembled just a little. As soon as Conroy returned from a final reconnaisance and check of the area around the ejection port, Steve was going to take this last saucer back through time and space for a rendezvous with yesterday. Nothing could be done, now or ever, to save the radiation-rotted, dying world of the year 1980, but there was a million-to-one chance that Steve could

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succeed where the rest of the Suicide Squad had failed. Succeed, that is, in reaching back into the months or weeks before that first attack, and persuading the nations of the earth to hold their fire for the sake of the human race.

Footsteps sounded behind Steve and he turned quickly. Conroy hurried into the lab. He was panting, and blood ran from a gash in his head.

"They've located us," he said. "Hear them?"

The two men listened. Far above, deadened by the screens in the main passageway, was the sound of heavy blows.

"They're battering the air-lock with an old tank. They nearly caught me. Tag-end of some sort of a war-party. If they'd been better disciplined they'd have had me. They weren't . . . . like us."

"You mean the Russians are over here with *tanks?*"

"Not Russian," said Conroy. "Mutations. Non-human."

Steve whistled soundlessly. "So soon—? Mature mutations?"

"You haven't been topside lately." Conroy's face muscles twitched. "It's—horrible. What isn't burnt off is . . . loathesome."

Grace Vannevar came in quietly with food on a plate and cups of some steaming beverage. Both the men stared and sniffed incredulously.

"Coffee, by the gods," breathed Conroy, and held out hands which shook in spite of him. "I thought that had gone with tobacco and everything else." The three sipped hungrily, savoring the delicious fragrance.

"I saved a small can of coffee for a celebration," said Grace.

The tired lines in Steve's face relaxed as he grinned at his wife. "I'm almost afraid to ask what we're celebrating."

She rested her hand lightly on his arm. "We're drinking to your good luck, my darling."

They finished the coffee quietly, munching on the greyish flat crackers which contained the correct balance of vitamins and minerals and tasted like dried library paste. Then Conroy set down his cup. "I think you'll make it," he said. "We know the force shell works. Nothing—not even collision with a planet—can hurt you while the shell is on . . . although it's goodbye, planet. Then when you pass the speed of light, your personal atoms and those of your ship interpenetrate with the atoms of anything you run across. Lowe plotted your course around the closed cosmic curve of the Einstein universe so as to bring you back to the area Terra occupied during that summer of 1958. At better than twice the speed of light, you should make it in twenty years, objective time; but at that speed, you'll grow younger instead of older. Lowe figured it at about a fifteen years' retrogression," Conroy finished.

"That'll make me a snappy twenty-five," Steve grinned at his

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wife. "I'll look you up, doll—give my younger self some competition."

"That's exactly what you won't do," growled Conroy. "Two Vannevars trying to occupy one space-time might wreck everything. That's why you've got to stay away from North America. Pilot the saucer to Russia when you get back there, and try first to persuade the bosses of the Kremlin to hold their fire. They can invite some of the top men in Washington to meet with you in Moscow."

"I still think Steve should go to England or Canada and ask the government there to mediate," Grace said. "History doesn't suggest the Russian leaders were especially cooperative."

"That's just it. We'd defeat our purpose. The Kremlin'd write off English or Canadian statements as propaganda. Steve's got to give them the facts directly. They won't want to be destroyed any more than we do. Above all, don't go near the United States. We haven't any idea how this time travelling works, or what the paradoxes will be, but at least we've avoided one glaring error the earlier experimenters made. How could they overlook the fact that while their machines travelling forward or backward in time stood still, geographically, the earth itself wouldn't be standing still? Even overlooking solar drift and rotation around its axis, there is still earth's orbital motion around the sun. The earth of six months ago is as far distant from this present point in space as it is in time. If we sat still in space and tried to move back or forward in time, the earth would move out from underneath us."

"Einstein rubbed their noses in it, with his space-time continuum, but they were so busy applying his theories to everything else, that they forgot to apply them to time travel," Grace suggested.

"Time travel was a gimmick for the science fiction magazines, then," said Conroy. "No reputable scientist would waste time on it."

"All the scientists who are left in this country are betting all the time in the world on it, now," Steve said grimly. "If this doesn't work, the human race can shut up shop."

"They have already," gloomed Conroy. "The new births aren't human."

Grace turned her face away. Too late, Conroy remembered her child, born six months after she and Steve entered The Hole . . . what it had looked like and how it had died.

Steve put his arm gently around her shoulder. "I wish you'd come with me, Grace."

"I want to, dear, but the scales are already loaded too heavily against you. Even with the oxygen converter and the nutrient tank, we aren't sure—"

"We can't be sure of anything!" Conroy burst out. "We've been sending old planes, rocket ships, anything we could get off the ground, forward into the past. Fly-

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ing tin cans equipped with force shells and jets. And never a word of whether they reached twentieth century Terra successfully or exploded in some godforsaken corner of the universe—" He broke off, shocked by the look on Grace's face. "We do know some of them got through," he tried to reassure her. "Remember those flying saucer sightings in the fifties? Those were our men: Billings, Jocelyn, Dewitt, Santos—some of them made it around the circle and back to Earth."

"Then why didn't they land, make themselves known, stop the war?" Grace's voice trembled for the first time.

"Going too fast, perhaps," Conroy said awkwardly. "My plus-gravity drag ought to take care of that."

"Some of them hovered, slowed, turned—" Grace protested.

Steve put his arm around her. "Let's face it. We've no idea what forces they'd run into, whirling through space and time. Perhaps they changed—mutated. We think they'd be younger. They might not even be human any more. But we've got to keep trying."

Grace said, "We know none of our men succeeded in preventing the war. If they had, we four would have—winked out. Any major change in the course of history would automatically create an entirely different future. And we're still here . . ."

Steve frowned. By making a success of this mission he'd destroy them both—and Lowe, *before* he created the force shell formula—Steve rubbed his forehead. "Why don't we all go?"

"We've discussed that before," Grace said steadily. "There isn't enough nutrient or oxygen or fuel. There's only one space harness and one cradle. And four returnees would be four times as likely to create a time paradox. We can't jeopardize our chance of preventing—this." She smiled. "And no matter what happens to us—*now*, there's always us—*then*. You'll be giving us a new lease on life." But I might never meet you in the new time-pattern, she thought miserably. *Good-bye, my beloved.*

She laced him into his space harness, thinking as she did that she could be a medieval countess helping her knight to don his armor before a battle. Her fingers were unusually clumsy.

Steve had been under so great a strain for so long that he felt drained of emotion. *I love you,* he thought, watching her intent face. *I'd better tell you so. I won't have another chance.* He touched her cheek lightly with his finger tips.

"Be a good girl while I'm gone." It wasn't what he had intended to say, but she seemed to understand. Her smile was steady. Steve walked over to the saucer which rested in the launching rack. Everything was in place, checked and rechecked. As he climbed the wheel-up steps to the cabin, he said thankfully, "Our

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visitors seem to have given up." It was true; the pounding on the air-lock above had ceased. Conroy came up the steps after him, peering into the jet vents, poking nervously at the air-lock seals, tapping the shell of the ship which the young technicians had called "The Crack of Doom" because they swore the saucer would last that long—or longer. Where were they now—Willis and Bates and Denby, who had created and moulded that eternal material? They swore that no torch or explosive, not even the heat of suns nor the unimaginable stresses of space could warp it. Less durable than their creation, they were long gone: Willis of an undiagnosable fever, Bates a suicide, Denby never returning from a foray up to the surface. But their ship was here and protected with every safety gadget the scientists could devise.

The "cradle," for instance, into which Conroy was helping Steve settle himself now. It consisted of a shell within a shell. The outer chamber was the hydraulic shock-recoil unit, in which the inner shell floated. No matter how severe the pressure of acceleration or deceleration, the sluggish fluid within the chamber neutralized it. Further to protect the occupant, the inner shell was a vacuum, in which the pilot floated, space-harnessed, warmed and nourished enough to sustain life, and constantly fed a trickle of pure oxygen.

Conroy had also devised a gadget which would stimulate the pilot back to full consciousness when the ship reached its goal,—that is, manoeuverable proximity to Earth in the summer of 1958. At this time, the fluid in the outer shell would drain into a reserve tank, oxygen would be pumped into the inner shell, the lid would open, and the pilot would receive stimulating massage from electrodes in the harness. As he adjusted the nutrient needles and electrodes carefully on Steve's arms and legs, Conroy said, "At least you'll arrive back there alive and kicking, even if the ship doesn't."

Steve chuckled. "That's good to know. Now if you could just arrange for me to sprout wings in case of mechanical failure—"

Conroy frowned. He was always putting his foot in it. Then he met Steve's grin with one of his own. "Grace," he called, "you want to say so long to young spriggins here before I put the cork in his mouth?"

Grace appeared at the open air-lock, waved a kiss from steadily-smiling lips, and went down again. Conroy placed the oxygen mouthpiece between Steve's teeth, clamped his nose shut and lowered the helmet. At once Steve was in the faint, comfortable glow which would be his light till the ship reached its goal. Already he could feel the gentle drag of narcosis pulling down his eyelids. Pleasantly drowsy, he was aware only dimly of the noises as Conroy activated the pump to create a vacuum around Steve. When Conroy closed the out-

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er shell, filled it with fluid, set the automatic controls and stepped out of the saucer, Steve was already floating dreamily on a pale sea of light. He did not hear the ponderous slab door of the port swing shut; nor was he aware of the almost noiseless clicking as the automatics took over, those infinitely competent machines which would hold his life in their metal hands till the ship reached its goal.

To the two watching so tensely, the disc-shaped ship suddenly glowed into shimmering light; a strange, biting scent filled the air; far above, the ejection chute lock opened for the last time. The little ship quivered slightly, then began to glide slowly up the ramp toward the lock. As it went, the brightness increased until the watchers squinted against the glare. The trim outlines of the craft were lost; it seemed now to be a sphere of light as it flashed into the sky to begin its journey through the future into the past.

Steve floated endlessly, timelessly, on the sea of space. The Crack of Doom hurtled through the universe at better than twice the speed of light. To a human observer within the ship, had there been one capable of making observations, everything in the small, efficiently-ordered cabin would have seemed as usual; but the mass of the ship was so great that its atomic structure swept like a giant net across the void—a net through which meteors and moonlets and even planets slipped like tiny, sparkling motes.

In the wake of the ship, the millennia fled away . . . .

Steve Vannevar awoke with a tremendous sense of unease. There was something he had to do . . . . HAD TO DO . . . . *right now!* He tried to get up and experienced a moment of utter panic at finding himself encased in something rigid and unyielding. Then he remembered; and relaxed to let the automatic guardian finish its pre-set task. The hydraulic fluid drained away from the outer casket, oxygen flowed into the inner vacuum, the inner lid lifted and the vitalizer, whose electronic fingers had kept Steve's body in tone through the long hibernation, clicked off. After a time the man sat up gingerly and detached the nutrient-supplying needles from his arm. Next the cathodes were removed from legs, throat and wrists. Then, lumbering like a great bear, Steve hauled himself out of the casket and began to take off the space harness.

He felt fine. A little stiff perhaps, and a little shaky, but even those feelings were rapidly passing off as he moved around the control chamber. His first task was to determine his position. Within minutes he was staring through the forward visiplates at a large grey-green ball turning lazily in the void directly in front of him.

"I made it!" he cried softly, catching hold of the frame of the plate and peering elatedly at the

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familiar outlines of the continents. He knew a momentary regret that he had slept away the whole of that incredible oddysey. What sights a man could have seen! But the space-medicine man had said no. Better to miss the scenery and the tensions—and to arrive sane and normal. Excitement caught him up again so that at first he did not notice just how fast the clouded ball was enlarging. In a few minutes it had filled the whole of the plate, and Steve realized that he was falling toward earth at a speed of many thousand miles an hour. He put the ship into orbit and began braking.

Hours later, shaking with weariness, he was still braking, this time well into earth's atmosphere. It struck him as ironic that he had crossed the universe with less effort than these last few hundred miles required of him. As he came in over Russia, jet interceptors smoked up to challenge him, but he left them standing. At the last possible moment, he cut off the force shell around the ship. Hitting the rear jets, he swung the gyro-handle. The little saucer swung obediently into proper landing position—but two of the jets misfired. The saucer side-slipped. Steve saw the tops of trees plunge up toward him. There was a splintering crash, the saucer slewed sideways, tore through the trunks of massive trees as though they were toothpicks, and ploughed into the ground in a little clearing. Steve's head hit the visiplate.

He had been able to cut the jets before the crash. Even so, the forest around him was crackling with flame when he opened his eyes. Acrid smoke drifted into the saucer. He could feel the vibration of someone pounding on the hull. Staggering to his feet, he groped his way through the choking haze to the airlock. The inner door was ajar and opened easily at a touch of his hand; but the outer lock was wedged open about two inches. Smoke from the burning underbrush poured in through the crack. The voices of men shouting sounded loud above the crackling fire. Suddenly a crowbar was thrust through the opening. Someone barked orders in Russian.

"Right on the button!" thought Steve, and passed out again.

His second awakening was a rude one. Someone was slapping his face—relentless, savage blows. Steve tried to put his hands up to defend himself and found they were tied to the sides of his chair. He squinted and peered, trying to focus on the figure that swam disconcertingly in front of him.

"That's enough," growled a deep voice. "The capitalist spy has condescended to acknowledge our presence."

Through a king-sized headache, Steve got the room into focus. It seemed to be a meeting-place of some size, with rows of wooden chairs and a wood platform with a lectern. Back of the lectern, on the wall, a huge new-looking poster blazoned the face of the Leader. A

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group of roughly-dressed men stood in a semi-circle around the chair in which Steve was tied, and directly in front of him loomed a sneering giant, fists on hips.

"Talk, you!"

"I still think it would be better to send him directly to the city, Comrade Ivov," said a gaunt-faced farmer, both of whose hands were wrapped in bandages.

"Who asks you to think?" taunted Ivov. "Am I not the man appointed by the Party to handle matters in this district? Just because you burnt your fingers rescuing the decadent foreigner, do you think you have some responsibility for him? Leave the decisions to those capable of making them."

"You know the army will want to inspect the ship and question this man as soon as possible," persisted the injured man. "He may know much that our country should learn—"

"And that's exactly what I intend finding out," bellowed Ivov. "Do you think I want to spend the rest of my life in this broken-down hamlet with mire on my boots? This is *my* territory, *my* discovery. I'm not likely to let some button-polishing Party messenger boy go running to the Leader with this meaty scoop as though he'd been responsible for the whole occurrence! When I'm through with this spy, I'll know everything he does —even if I have to tear his tongue out to make him talk!"

"It is a good thing all the men in your village are not as stupid as you," said a cold voice behind him. Ivov whirled. His heavy face drained of color. A lean man in a plain black suit stood inside the open door. At his shoulder ranged four Secret Police, also in black.

"Feodor!" Ivov breathed the dreaded name of the chief of the Secret Police. The latter nodded emotionlessly.

"You are ready to surrender this political prisoner to my men?"

"But—but he's an enemy soldier —a capitalist spy—!"

"Whom you intended to destroy before either the Army or my staff had a chance to examine him. This will be remembered, Ivov." Feodor gestured curtly to his men. "Place the Commissar under local arrest, to be forwarded to headquarters with the next bunch going through. Take the prisoner to my car. Two of you keep watch on him there till I join you. Some of you Comrades," he turned to the ring of farmers, "lead my other two men to the crashed ship." Ignoring the grey-faced Ivov, he continued, "The fate of the self-seeker, Ivov, may suggest to you that it is a mistake to allow personal ambition to come before service to the State. I was pleased to hear that you were urging an immediate report, Comrade," he said to the bandaged man. "You may act as Commissar for this district until the Party has time to make permanent arrangements. Be assured that the eyes of the Party are upon you at all times—"

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"As are those of the glorious Red Army," added a new, jovial voice from the doorway. A chubby, red-faced Major stood there. Behind him, a dozen soldiers were disposed, seemingly casual, yet efficiently cutting off any exit from the room.

Feodor grimaced involuntarily. "Your spies are almost as efficient as mine," he admitted grudgingly. "Who else knows about this?"

"Everyone from the Leader to his cook," shrugged the jolly-looking Major, chuckling. "I've got a personal order from Himself to bring the prisoner and his ship to Depot One immediately. The ship is to be completely shrouded from sight while it travels. Some of my boys are already on their way with equipment to sling it on a truck. The crash area is to be combed clean of anything which might give us information. The Leader suggests that your men do a good clean-up job there, Feodor. Bring every scrap of metal, paper, cloth, anything which might have any connection with the prisoner or his equipment. But I don't need to tell you how to do your job, do I?" Smiling around the group of silent farmers, he continued, "I have orders to bring everyone who has seen or talked to the prisoner, or seen his craft. Especially the man who entered the ship and burned his hands rescuing the pilot."

"He knows even *that?*" whispered Ivov.

The Major shrugged and chuckled again, but didn't bother to comment. Slowly the farmers filed from the room, Ivov shambling brokenly after them. Steve was so stiff from the tightness of his bonds that two of the soldiers had to take his arms to help him to walk. When he was seated in a huge sedan between the Major and a massive soldier, the car started off at once, leaving Feodor standing watching.

The Major leaned back and offered Steve a flask from a compartment beneath the window, saying in flawless English, "Tell me, my friend, has the Hot War finally started? Are you the first gun?"

Steve took a moment to gulp the scalding liquid. He was still groggy from the effects of the blow he had received when he smashed against the visiplate. How much would it be advisable to tell this pleasant-seeming Major with the very shrewd black eyes? Well, he'd have to begin somewhere. And at least, the war hadn't started yet, if the Major suspected him of being part of the opening attack. It was a cheering thought.

"I'm rather a special messenger," he began slowly. "I'm more than willing to talk to you now, although what I've got to say must be addressed to all the top people in your government."

"Curious Western misapprehension," smiled the Major, "that it is necessary to have many people to make a decision. The democracies lose so much following that outworn ideology. Surely such a race of perfectionist-engineers as your-

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selves knows there must be one single leader to make decisions and obedient members to carry them out? Does the hand tell the head how to think? You of the West are even more foolish. You create a monstrous government entity with two heads, and then give it several self-interested advisors to further confuse the matter of decision." He shrugged again, smiling. "But, all the better for us, eh, Comrade?" He accepted the flask from Steve and tipped it to his lips. "So. Try the story out on me first; I'll tell you whether our beloved Leader will go for the propaganda line your leaders have worked out."

Steve turned slightly sideways to face him. "It isn't as easy as that," he said slowly. "I'm not representing any Western government. Where I—come from, the governments have all broken down." He took a deep breath. "I've come back from the future," he finished quietly.

There was a long moment of silence in the car. The shrewd black eyes of the Major widened slightly. Without any trace of a smile on his face, he said quietly, "They won't believe you, you know. Especially since it was your side that got back here . . . . But I got a look at your ship. I know we haven't anything to match it, and I doubt if your people have, yet. How did the war go?"

Steve told him.

The car drove slowly along a rutted country lane. They drew up in front of a well-camouflaged sentry-box, facing the hostile snouts of a dozen guns concealed within plausible shrubbery. Then a wide metal gate swung open, and the big car inched betwen metal posts and continued across an open meadow toward a small grove of young trees. The Major explained,

"The Depot's underground, of course. And I think you'll find most of the 'top' people down there to receive you. They've been itching for a chance to start things, and they think you may be it. Armed penetration of a peaceful country —a perfect excuse for retaliation. They certainly aren't going to believe your story. I'm not sure I do myself — even after getting a glimpse of your saucer. It could be terribly good propaganda, to scare us off." He shrugged. "One way or another, I'm afraid you're in for a pretty rough time, my friend."

The entrance to Depot One was screened by a pile of massive rocks. Inside a sort of cave was a checkpoint. The Major signed Steve in, touched his cap in a sketch of a salute, and walked off. Steve was marched down a wide, flood-lighted ramp between two soldiers, while two black-coated Secret Policemen padded along behind.

The ramp opened onto a busy passageway where white-coated technicians, worried-looking civilians and lounging Secret Police guards were jostled by pairs of soldiers patrolling stolidly. Steve's guards took him into an elevator

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which went down interminably. The door finally slid open on a narrow, gloomy corridor. Rows of heavy doors faced onto it, each one with a small steelmesh peephole. One of the soldiers opened a door. The other pushed Steve from behind. He stumbled forward into the cell and fell against the far wall. The door clanged shut.

The cell was small, cold, and completely empty except for Steve. They left him there for twenty-four hours—without light, heat, food, water or the sound of any human activity. After the first few hours, Steve realized that this was part of a plan to weaken his resistance and make him more amenable to whatever suggestions his captors would care to make. His head ached and he was hungry, but there was nothing to do but wait, so he stretched himself out on the concrete floor and tried to relax. It was very cold and damp; after a time he was forced to get up and walk to restore warmth to his aching body. When many hours had passed without a sign from his captors, Steve began to wonder if it would not have been better to try to contact the United States of 1958. There, at least, he would have had a hearing.

When the cell door finally opened, the light blinded Steve momentarily. A soldier entered the cell with a rifle and prodded him out into the corridor, where two other soldiers took over and hustled him up a corkscrew ramp at the double, till his lungs were pumping with the unaccustomed exercise. Then they thrust him into a garishly-lighted room and slammed the door behind him.

Facing Steve across a varnished table were three men—the Major, Feodor, and between them, a pudgy balding man with a sly smile and tiny eyes, whom Steve recognized from remembered newspaper cuts. The Leader looked him over carefully.

"This is the advance guard of the Invasion?" he asked. "Doesn't seem so formidable."

"My name is Steven Vannevar, Excellency. I am a scientist in the field of aeronautics. I have come back in time from approximately 1978 to warn the nations of the earth that the Hot War, soon to begin, will end in the destruction of the human race."

The three men stared at him. Then the Leader raised plump hands and clapped softly. "Excellent! Quite a dramatic performance! Are we now to determine, with twenty questions, what is your real employment? Are you an actor, or possibly a science fiction writer?" His cherubic smile vanished completely and he glared at the Major with cold little eyes. "What sort of nonsense is this? You bring me out here to listen to the puerile histrionics of a capitalist warmonger—"

"Except that I'm not a warmonger," put in Steve. "I'm trying to stop a war, not—"

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Something heavy crashed sickeningly into the small of Steve's back, and he fell forward on his hands and knees. The Leader, restored to good humor by the action of the soldier, chided merrily, "You must not interrupt me when I am speaking. My loyal soldiers do not like it."

Steve stared up at him through a haze of pain. "My ship has been brought to you by this time, Excellency. I am sure you must have seen it. In it, I returned from the ruined world of twenty years in the future. Your scientists will tell you that it has many features undreamed of by the science and technology of this day—"

"Undreamed of in the decadent democracies, perhaps; our own ships now flying are superior to the craft you try to palm off as a triumph of future science. No, my dramatic friend, you'll have to do better than this. Your story is full of absurdities on the very face of it. Major Kerelin repeated to me the tale you told him, and while it is so farcical that it doesn't deserve a rational reply, I will make one. I shall merely suggest that if your story were true, and you succeeded in persuading us to patch up some kind of peace with the war-mongers, you would be dooming your own friends and the world as you knew it, to oblivion. The Major says you believe a change in the historical pattern will create an entirely different future—one in which all now living would share, but which would exclude as unassimilable paradoxes your own life and that of the wife and friends you left behind—all flung in the scales in a single altruistic gesture! I know men, Steven Vannevar. A man might betray his wife and friends, but to throw himself and his whole world into limbo—that's too much altruism! So. We end this farce. Why are you really here? Feodor thinks you were on a reconnaisance flight and crashed due to some failure of your inefficient capitalistic machinery."

Steve staggered to his feet and advanced toward the table. "Don't you listen to your scientists? You blind fools, can't you see—" but the rifle butts crashed into his body again, and he drowned in a sea of pain.

The interviews continued in a nightmare sequence, always in the same room but never with the same interrogators. After each one, Steve was led or carried back to the small dark cell. He had reached the point where it was difficult to distinguish between reality and hallucination. He would find himself standing in front of the wall in his cell, proving to the blind concrete the truth of his claims. The soldiers brought him a little water, and a hunk or two of greyish bread, but no one except the interrogators spoke to him, and there was neither light nor heat in his cell.

Then one day when the soldiers came for him, they took him to a

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different place. He was pushed under a shower and given a clean coarse shirt and trousers to put on. Then he was set down at a table and given a tin plate full of stew. Restored as much by hope as by the warm water and the clean clothing, he wolfed down a few bites ravenously. Then rising nausea made him push away from the table.

"I've had enough," he muttered to the soldier who stood watchfully beside him.

"Come," commanded the man, and led him out to where the inevitable two guards waited in the corridor. When he saw that he was entering the interrogation room again, Steve almost ran in panic. Then he saw the pudgy Leader flanked as once before by the Chief of the Secret Police and Major Kerelin. Steve pulled himself together. Something important must have been decided to bring these men together again in this room. Had the War started. He waited nervously for the Leader to finally speak.

The great man was shuffling through a thick file of papers petulantly. He brought his small cold eyes up to Steve's face. "They tell me you persist in your fantastic story even under the influence of truth drugs," he began abruptly. "My agents have investigated in your own country and tell me there is a Steven Vannevar working for your government on guided missiles. They have taken photographs." He tossed several large glossy prints at Steve. "Enough like to be your twin brother, no?"

"Those are pictures of me as I was twenty years ago," said Steve dully.

"Then why do you look like that now, if you claim to be twenty years older?" snarled Feodor.

The Leader held up a pudgy hand. "Enough of this nonsense! You confuse even yourself. I'd have you shot now, except that the scientists and the army are nagging day and night to have you explain to them some of the features of your craft. So I have made my decision."

Feodor stared straight at Steve, his face impassive. The Major looked worried and hopeful at the same time.

"You will go with Major Kerelin, but under the constant surveillance of Feodor and his men. That way, the army won't be able to steal any scientific secrets to use against me. You will answer all questions fully and demonstrate all your apparatus. When we have a full report, you will be transferred to another place to stand public trial as a spy. This will give me a valid excuse to launch an all-out offensive against the decadent democracies. It is a little ahead of the schedule I had set up; but your war-mongering scientific gadgetry has disturbed my subordinates. Your country mustn't be allowed to get any further ahead of us."

Steve's mind rocked under this blow. It was clear that his whole trip through time and space had

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not only not helped the world, but actually hastened the day of its destruction! Or worse—the thought came to him—he had handed the enemy a quick victory, clean-cut, overwhelming. When the operation of the force shell was explained to them, with its incredible by-product of acceleration at twice the speed of light, they would make short work of any power that tried to stand against them. His mind fumbled wearily at the disaster. There would be no terrible aftermath of radiation poisoning, no lingering horrible death for the race. While he had not succeeded in preventing the war, he had shortened it, rendered it less awful—saved human kind . . .

To be the slaves of the Enemy. Would their rule be for a thousand years, with the power he had given them—or for ten thousand? And what would become of the spirit of man when the Conqueror of Hungary got through with it? Preservation and enslavement—or liberty with death? What good was liberty to a dead man?

Steve knew what he had to do—but the idea appalled him. He staggered a little. "Could I—sit down? I'm . . . this last few days has been . . . rather a strain . . ."

For a moment he couldn't believe his ears. The Leader was laughing, a high-pitched giggle of amusement and appreciation. Then the others were laughing too, watchful eyes on the Leader, and a soldier brought a chair in response to a gesture from the Major.

"I've just thought," Steve said, "that in coming back through time to prevent a fatal war, I've given you the weapons to win a quick, comparatively harmless one."

There was a sudden, complete silence. The Leader peered up at him with cold small eyes. "How's that?"

Steve shrugged. "You get the force shell, which not only protects whatever's inside it, but generates a drive faster than light. Shall we all go and look at my ship?"

"Why should you be all so suddenly happy about this?" The little pig eyes bored into his.

"Because, whether you believe it or not, I made quite a trip to get back here to save the human race from wiping itself out. I guess it doesn't matter too much how I accomplish that—as long as I do it."

"You want to bargain for your life?" suggested the Leader.

Steve found he could even grin. "Don't let's be naive, Comrade Leader. We both know I'll last about five minutes after I finish explaining the devices in my ship to your scientists. But what does it matter? I'm already living in the United States, in my body of 1958. So what you do with this one doesn't really signify. You can't touch that one."

"Yet," said Feodor.

The Leader struck him across the face. "Of course we won't hurt any of your bodies, Mr. Vannevar. We are essentially a peace-loving na-

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tion. When we have demonstrated our supremacy in science and technology, we'll find a place for all the weaker nations. There will be work for all."

"I'll bet," agreed Steve. "Shall we get at it?"

The saucer was on an insulated stand in a huge underground machine-shop-laboratory. Scientists and technicians, each of whom had his attendant Secret Police guard, huddled around the enigmatic ship. They had made no effort to repair the crash-sprung air locks. Steve looked the damage over carefully. The Leader was practically breathing down his neck.

"Can it be repaired? Will the devices work?"

"I think so. I'll have to check, of course, but nothing vital seems to be damaged. How do you want me to do this?"

"What do you mean?" The Leader looked suspicious.

"I imagine you wouldn't like me to just get inside and start things running." He grinned broadly. "I might escape."

The Leader peered at him. "Through mega-tons of rock and concrete and steel and earth?" he jerked a thumb at the roof.

"I'll go inside with him," Feodor thrust forward eagerly.

The Leader looked at one of his personal guard. He nodded once. The soldier shot the Chief of the Secret Police in the back. No one said anything. Two stolid guards picked the body up and carried it away somewhere.

"Anybody else want to volunteer?" asked Steve.

"Potkin, Semerov, enter the ship with Vannevar. Major Kerelin, you will act as interpreter," snapped the Leader. "The air lock will be left open. If Vannevar acts suspiciously, he is to be restrained and dragged out here."

"Bring your notebooks," Steve advised the eager scientists. "There are several equations you'll want to write down." He waited while they got their books and rejoined him beside the saucer. Then he motioned Major Kerelin to go ahead of him. "We call her 'The Crack of Doom,' " he began conversationally, "because we believed her hull would last that long. The elements which were fused under terrific heat and pressure to make the amalgam were . . . ." Kerelin was translating in a rapid undertone; the scientists scribbling as though their lives depended on their getting every word.

"Dr. Telford Lowe got the idea for the force shell about five years ago, our time—that is, roughly 1973. He was looking for something to protect our time-and-space travellers from accidental collisions with suns and planets. Incredibly, the gradual application of the force shell created accelerations up to more than twice the speed of light. The equation for the force shell was . . . ."

An hour later, Steve was finishing his explanation. The scientists,

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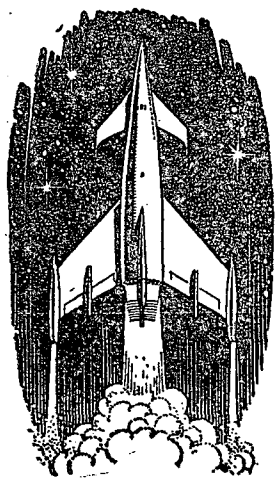
avidly interested, were alternating between jotting hasty notes and tentatively handling the various levers and switches. "One more thing, and I believe you will have it all, gentlemen," concluded Steve. "Then, if you wish, you may ask any questions which occur to you." They nodded eagerly, hanging on his words like children at a play. "This last device is called the escape button." Steve touched the small red manual switch which activated the force shell. Not the safe, carefully-graduated automatic activator, but the instantaneous, full power switch-on Denby had called the 'scram switch.'

"We never used it," Steve continued in that quiet even tone which had lulled them into forgetting everything but their interest in the fabulous machine. "Theoretically, it would bring the ship and its contents to twice the speed of light instantaneously. Perhaps in the interests of science, we should leave no possibility unexplored?"

Kerelin's eyes went wide with terrified realization. Too late. Before he could move, or even cry out to warn the scientists, Steve had shot the switch over to Maximum.

In the thousandth of a second before the mass of the saucer expanded to infinite in a flaming explosion which detonated every bomb in the underground depot, Steve wondered if his action would save the human race, or release the dreaded chain reaction which could destroy the earth.

And then came the cleansing flame . . . . . .



NEXT MONTH—

Lee Correy's HOMECOMING
Christopher Anvil's NERVES
Robert F. Young's ACRE IN THE SKY
Frank Herbert's A MATTER OF TRACES
Miriam Allen de Ford's
OPERATION CASSANDRA

and

Jay Williams' exciting new novel—
SEED OF VIOLENCE

—in *FANTASTIC UNIVERSE*

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let the dream die

by . . . Stanley Mullen

It was an odd feeling, to be leaving the life one knew so casually, resigning from the ranks of the zombies...

It is like being in the dark and having a sudden spasm of vertigo twist through your brain. You reach out to surrounding darkness, seeking something solid to hold onto, and there is nothing there. Nothing as solid as your fear.

You have said your say, and you are glad. You said it aloud, right out in the open. Said it for everyone to hear, right over Channel 4, with the captive audience of twenty million TV zombies watching and listening. It will do no good. You know that. But you have had your say. Like a man, you spoke out for freedom of mind and body while you still had the chance. Twenty million people heard you say it, and you got most of it said before you were cut off the air.

Now—

Fear is like a chord of alien music vibrating soundlessly inside your brain. You wonder what inhuman fingers plucked the strings to play that unearthly siren song which, like Ulysses, only you among men could hear. Among living men, that is—

Now—

You are alone and frightened. You can hardly lie to yourself about that. You were cut off the air. You

It is a strangely possessed world, this world of the living dead—walking and talking, eating, working, making love, and pretending to be alive . . . Jay Stark, TV columnist-commentator, revolts against this world, in one of the grimmest tales of Tomorrow that Stanley Mullen, distinguished SF writer, has brought us.

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rushed in where angels fear to tread. That makes you a fool. For the moment, a live fool. But sooner or later, a dead hero. Unless you think of something. Before they anticipate you.

Your plans included nothing about what you would do afterward. Maybe you never faced the fact that there would be an afterward. Now you have one of three choices, none of them good. First, you can just sit and wait for their security police to come and get you. Second, you can turn yourself in to their psychiatrists, any of whom will quickly certify you as paranoic with delusions of persecution. Third, you can start running if you make your decision quickly enough.

Three choices like the Witch-wishes of legend. None of them good. And in the end, all three lead to the same black hole. You disappear. That's a joke, but not a funny one. You will disappear, all right. Just as all the others you mentioned have disappeared. With the first two choices, you go into prison or the disintegrators, or the nuthouse, which is probably the same thing. Either your body or your brain comes out mincemeat.

The third choice offers a little leeway. Run—but where? Start running, as some of those others did, and somewhere the earth opens up to swallow you. Bang! you go out of sight and out of knowledge and memory. Nobody remembers you, nobody asks after you. And if anyone should, the files have been doctored so there is no record you were born or died, or ever existed.

Who, what, how, why? are questions you have not tried to answer. It is enough to know some question exists. It is too much, perhaps. Everyone who got curious, who nosed around, asking questions—vanished. So you had to nose around, asking stupid questions, getting unsatisfactory answers or none. You had to get interested, keep poking around, learning too much for your own safety. Then as one of the few tame commentators left on TV you had to shoot your mouth off over the air.

No wonder you were cut off the air.

There are no rules, no statutory penalties for making a 14-carat fool of yourself publicly. The people who do so, for any reason, simply vanish. And you are not ready for that yet. You told the big blank public what you thought and what you suspected. You dared to mention all the disappearances, the doctored records. You named names, gave dates, told facts. You had the supreme guts or supreme stupidity to broadcast what you already knew.

You mentioned Charles Fort and his stories of earlier disappearances. You gave whatever statistics you could lay hands and tongue on. You asked Fort's question: Are we property? Are we kept like cattle by alien beings? And if so, why? By whom? You kept on talking about the zombie-like quality of people in the streets, their robot-quality at work,

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their sheeplike stupors at home. You hinted at hypnotism on a large scale —possibly with television as its mechanism—you taunted the half-men, walking and talking, eating, working, making love, pretending to be alive. The living dead, you called them, including most of civilized humanity, forgetting that the captive audience you addressed were part of that zombie army.

You were right, of course, and that is what is wrong. Mankind is enslaved, no matter how or by whom, and you are only the slave who dares question his chains.

Run—

A TV columnist-commentator has many contacts, but few friends. Offhand Jay Stark could think of no one who would even miss him, let alone hide him. It was surprising now that he considered the matter how complete was the vacuum in which he had lived. *Had* lived.

His cubicle office-studio with its crowded files and the remote control microphone equipment suddenly seemed cramped and stifling. Even without the whip of fear, he would have felt a necessity for going outside, anywhere there was space around him. He felt the condemned prisoner's claustrophobia. A wild thirst for fresh air tugged at him.

Outside, habit reminded him that he had not locked his studio-office, nor cleared his desk. No matter. Probably he would not be coming back, and the Pushers would clear his desk. They would soon enough clear away all evidence of his existence. No need to go back. He had burned his bridges and there was no going back. Not ever.

As usual, the elevator robot with its mechanically monotonous voice irritated him. "Call your floor clearly if you please," it demanded, not unreasonably.

"Ground floor," he told the emtpy elevator, feeling that he was talking to himself. For that matter, he almost was.

It was excusable. It was an odd feeling, leaving one's life so casually, knowing that someone would be around to put up a "No Vacancy" sign almost before your chair seat cooled off.

In the street a parade was going by. One with the usual array of military units and brass bands, the usual flutter of flags, and the clustering of vapid-faced multitudes lining the sidewalks. Nowadays there was always a parade of some kind, an advertising deal sponsored by merchants, a parade of zombie school children escorted by commercial clowns, a parade in which TV celebrities were welcomed to the city, a parade organized by some lodge-group or other, religious processionals, and the ever-present military displays of men and materiel. It seemed that many people had no other occupation than that of watching parades.

Instinctively, Stark glanced around the street. The pattern of the planned disappearances was well-known to him, and he wondered grimly how soon the pattern would

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take form about him. Even if you saw the Pushers coming for you, it was not according to the rules to try escape. Somehow, smoothly, you were engineered into a big black sedan. There was never uproar or violence, or even a hint of brutality. The victim was expected to go quietly, offering no resistance, not calling a lawyer or notifying his family, friends or employers. Strangely, the vanishings never left a provable vacancy. One not only ceased to exist, but everything about you was —erased.

But there was no sign of big black sedan, no sign of those well-dressed, glazed about the eyes, but polite and determined men who were the Pushers. Evidently the parade had delayed the arrival of the unknown enemy, and given Stark just a little time to look around, to think, and to make plans as if any plans would do him any good now.

Debating with himself, Stark felt a sudden, passionate urge for coffee assail him. It was irrational, but at the moment he felt everything in life was irrational. Back in his office, he could simply have dialed, and the automatic chute would have delivered coffee in a sealed container. But under the unusual circumstances, who could say what besides coffee might be in that sealed container? A painless hypnotic drug, or something a good deal more deadly? No, a public coffee bar would be much safer, as if degrees of safety mattered.

Nearest coffee bar was half a block down and across the street. Last time there, he had encountered Hawley. Stark let his mind do a flipflop. Perhaps Hawley! But he dismissed the idea. Hawley owed him nothing; they were not close friends. Why involve him? An independent thinker, yes. Not a follower of herd moralities, or herd obsessions. A tough and cynical character, mulishly set upon his individual way of life. Stark thought that Hawley did not even own a TV set. Perhaps—

But no. Their contacts had always been too casual. Hawley had made a few investigations for Stark. Before. But too much time had passed. Stark was not sure Hawley was still in business. There was a good chance he had even changed his address. And with time so short, there was no use starting a prolonged search. It would be hard enough to keep ahead of the wolves, without complicating his task by looking for a man he scarcely knew.

Stark still wanted coffee. If his world ended, he would still face that end with coffee in his hand or stomach. The parade stopped him momentarily. Not because he watched it, entranced. He hated such spectacles, especially the military ones. During his compulsory service, he had seen enough of militarism. The zombie faces of soldiers marching or riding in obsolete vehicles offended him. Trucks and tanks, bayonets and flamethrowers, even swords. Why was it that military technology always outlasted its usefulness and then became a strutting feudalistic sym-

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bol? Why these archaic instruments of death, this panoply of outdated destruction, why the gigantic machinery of discipline when there had been no major war for twenty years, no minor one for fifty?

Stark ran a gantlet of stares and frowns and shaken fists to hurl himself across the street under the juggernaut of thundering wheels. Darting zigzag to avoid pursuit, he reached the opposite side and thrust rudely between the watchers. Faces frozen with blankness built a shell around him. Roughly he pushed through, found an eddy, and let it swirl him into the coffee bar.

Hawley was not there. Oddly disappointed, Stark had his coffee, which was black and bitter, and left.

Still no sign of the Pushers. Stark mounted the steep ramp to a moving walk, and let the express hurl him across town. He had no immediate thought save escape in distance. . .

Kaleidoscope. The panorama of the city whizzed past like a traveltape run too fast. Streets, buildings, people fell away in a blur of motion . . .

The moving walk soared upon a high bridge over the old section of the city, partially bombed out, never rebuilt due to lingering "hotspots" of radioactivity. Stark looked down from the heights and wondered what it had been like living in a city with the constant threat of thermonuclear destruction hovering overhead like a sword on a thread. Then he was back over the new city, a different section, and the fleeting glimpse of the uneasy past but a memory. The bridge dipped, the walk swooped down, depositing its cargo of passengers into a busy depot.

Stark got through the crowds onto the street, forcing steadiness in his gait, calmness into his sweating face, not to attract unwelcome attention. Glancing around, Stark sensed a familiarity in the scene. He remembered that he had come here just before starting his search. Some errand. Yes, replacing his glasses, which had been broken. Recognition took him down the same street where he had wandered before, choosing at random an optometrist.

Memory stirred forgotten knowledge in his brain. If intuition is but the subconscious reasoning from knowledge we do not know we possess, Stark's subconscious got a sharp jolt. On a sudden "hunch" he decided to look up the optometrist. Reason, logic and conscious thinking was not yet in action.

But it caught up. Yes, Stark had wondered why, if TV were the mechanism, he had not himself been hypnotized into the zombie-like obedience of others. Yes, of course, the glasses. He remembered something odd about them. And something odder about the man he had bought replacements from.

Glasses! It was possible that glasses could somehow filter the visual images of TV to prevent the mass hypnosis he felt was at the bottom of the public stupor which had hor-

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rified him. Mechanical hypnosis, especially from such a source, had to be mostly from concentration upon visual patterns. With twenty to forty million subjects seated in semi-darkened rooms, visually and audially intent upon shifting patterns of vision and sound, there is the perfect set-up for mass-enslavement by hypnosis.

And the glasses had set him, Stark, free. Stark's lip twisted savagely. Free, yes, to speak out and run.

Somewhere behind it all were the monsters. Monsters who enslaved most of the races of man. Monsters who gave orders and were instantly obeyed by the marching zombies. Monsters who sent out Pushers to pick up anyone who dared question their rule, who even failed to observe proper submission and stupidity. The monsters . . . who pulled the strings.

Behind Stark rose the shrill scream of a siren. He had not been too careful about his trail across town. Many who had seen him would remember him. It should not be difficult for the Pushers to follow.

Suddenly, without conscious volition, he was running.

There was movement in the crowds along the way he had come. They parted in windrows, like the bow waves thrown in water as a ship forces passage. Over his shoulder, Stark glimpsed the big black sedans, moving steadily toward him.

Panting, but without slowing, he darted into alleys too narrow for vehicles. He ran down sidestreets, nearly deserted. He was in a mean district, where old buildings, empty, condemned, frowned down as he passed, their dirty windows as blank and empty as blind eyes.

He ran till breath tangled in his throat. He stopped, gasping, crawling into a broken doorway.

A tattered crone, dirty, aged beyond belief, stared at him.

"One who still runs!" she muttered, unbelieving.

Stark had lost directions. He questioned her. With a shaking, crooked finger, she drew a map of the district on the dust of a window ledge. She laughed when he offered money, waved him away.

"Run fast," she advised. "If you have a friend, still sane, go to him."

"What friend?" gasped Stark.

The crone shrugged, turning away.

Stark went on. Now he knew where he was headed. No man could run forever. No man could fight alone.

With fresh air, exercise, increased blood circulation, his mind was working more clearly.

If only there was an underground movement—subversive, if you will—and some way to make contact with it. Somewhere, in dark cellars, in ugly streets, among the poor and dispossessed, there must be a few untouched by the hypnotic corruption. Maybe a few like the crone. Some people, he remembered, were immune to hypnotism. Not always the most intelligent, but at least the few rebels would be hardy, tough-minded souls. It might be possible

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to organize them, to find some way to fight back.

Recurring, the thought of glasses. Perhaps such a group was already in existence. If the glasses had been made deliberately to serve that certain purpose, and been given to him intentionally, then such a group of untouchables did exist. And the only possible point of contact would be the optometrist.

In a fever of excitement, Stark made his way out of the slum district into a better section. He still went cautiously, with a weather eye cocked for signs of his pursuers. By intricate weaving in and out of streets, buildings, alleys, he hoped to give the hounds a hard trail to follow. He even found a public washroom, bought a razor from the slot machine, removed his moustache, hacked his hair into a startlingly different cut, rubbed smudges of dirt and grease to change the lines of his face. Not much disguise, but it would have to do.

Then he went directly to the shop where he had bought the replacement glasses. He tried not to build his hopes too high, but—

The shop was still there, what remained of it. A bomb had gutted the interior. Glass windows in front hung in icicle tatters. Inside was nothing. No optometrist, no mock-ups of different styles in glasses. Nothing. Nothing but ruin, desolation and despair.

Quickly, Stark turned in his tracks and got out of the neighborhood.

The Monster-Masters were not so easy to fight, he mused sickly. And what chance had a man, alone . . .?

Stark was calmer now, An encounter with the bleak-eyed Pushers, oddly, gave him confidence. He walked right through a concentration of them on his way back to the moving walkway. He walked through unchallenged, thanks to his improvised disguise. It was a bad moment, but he got through. Afterwards, he walked more zombie-like, as if disinterested in everything about him. He attracted no particular notice wherever he went.

But he was hungry. He had not eaten since early morning, and he had used a lot of energy. Without a ration card, he would be picked up at the first food station he tried to patronize. If he had a friend, he might share that friend's portion. But he had no one to call a friend.

What had the crone said: Find a friend. If you have one, still sane, go to him.

Stark could not call to mind a single friend. Not unless Hawley fitted that category.

Hawley was a straw to grasp at, and Stark was grasping at any straw, however weak. Hawley!

Ironically, Hawley's office had been in the building just across the street from Stark's own studio office. Well, it was the last place the Pushers would look for him. They knew he hed fled to a different part of town. They would waste time in

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looking for him there. Eventually they would trace him and track him down. There was no time limit. Not for them. There was for Stark.

At first, he had run like a rabbit. Now, he was running like a fox, but he was still running. All the advantage lay with the hunters. Everywhere he turned, a finger would be eager to point him out, to help run him to earth. Stark felt that each minute he stayed free constituted a minor victory. And, possibly he would think of some means to make contact with the group behind the strange old man who had sold him his new glasses. Stark wondered what had happened to the friendly old man. He was afraid he knew.

When Stark reached the street from which he had fled so hysterically a few hours earlier, he had a sense of coming full circle to zero. The parade was long gone, but there was still a crowd, still excitement. Security police and Pushers were everywhere. Shrewdly, bleakly, they scrutinized every passerby. How Stark got through the cordon was a mystery, even to himself. He had no real confidence in his impromptu disguise. Reflected in the mirror of display windows, he recognized his image only too easily. Terror-spurred, he doubted if he could fool even a fool very long.

But the Pushers and uniformed security police merely looked at and through him. He was not asked to produce damning ID cards, ration cards, driver's license, or any other of the myriad documents required by a bureaucratic autocracy. If the defenders of status quo had challenged him, Stark thought that he would have died on the spot.

Somehow, in icy calm, he got through. He wandered into the building across from his own. A directory gave him the floor, the office number. Hawley still did business there. Stark did not dare call to announce his coming or learn if Hawley were in his offce. Avoiding the robot elevator, he wearily climbed the five flights of stairs. He knocked on the door.

Hawley sat at his desk, a bottle before him. With a grin, he motioned Stark to the victim's chair.

Stark collapsed into it. Hawley poured a drink, and handed it to him. He poured another for himself. He raised his glass in a toast.

"Here's to the last sane men in a mad universe," Hawley said roughly.

They drank. In Stark's empty stomach the liquor burnt like fire. It became a spreading explosion, racing through his veins, bursting in his brain, destroying his hard-won calm. He put his head down on his arms and sobbed. Swiftly he got hold of himself. He stared at Hawley. Words would not come.

Hawley was short and sturdy, but not heavy-set, strong, stub-featured, like a bull-pup with protruding intelligent eyes, a general brindle-coloring which included his hair. His manner was quick, nervous, extremely alive, totally unlike that of the all-too-universal zombie army. In spite of astringents, skin creams, depilator-

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ies, deodorants—all widely advertised on TV—Hawley seemed sweaty, unshaven, greasy of complexion, and wholly unkempt. In a day of dispensable clothing, his garments looked slept-in, and probably were. So did his face. To Stark, he looked like an angel.

Even Hawley's professions — trouble-shooter and private investigator—were off-standard occupations which should not exist in a trouble-free world.

"Do you want to tell me about it?" asked Hawley.

Words geysered out of Stark. He realized now how deeply had been his need to talk, to tell someone.

He told everything, beginning with the replacement of his broken glasses. He told of the frightful vistas of new clear vision they had opened into a world suddenly gone nightmarish.

Stark went into graphic details. He told of the girl who had come to him, asking if he could help find her sister who had vanished into the unknown. Of his search, dilettante at first, then increasingly interested, of his doubts as to the questioner's sanity, and his growing conviction. Of corroborative disappearances in all directions. Of doctored records.

Stark elaborated how his suspicions had become terrible certainties. How he had checked back and forth, sometimes finding that documentary evidence was missing or obviously destroyed. Of obstacles thrown in his way by authority. Then his moment of mad determination to smoke the whole thing into the open by making his wild broadcast to a public too entranced to understand or care.

Hawley sat and grinned at him. Stark finished lamely.

"You don't believe a word of this, do you?"

"I believe every word of it. And it's worse than even you suspect."

Stark shuddered. "It couldn't be. You've known about this all along?"

"Of course. It took you a long while to find out, didn't it? And when you did, you had to rush your fences. You could have been very useful to the 'opposition' if you had used a little more tact and caution.

"I doubt it," ground out Stark viciously. "They were already beginning to catch on. I had asked too many questions, some of them in the wrong places. They would have caught me. At least, this way, I go out in a blaze of glory."

"Do you?" asked Hawley. "I wonder if you have led them here to me."

The thought sent naked terror screaming through Stark's veins. Hysterically he considered it.

"It's possible, but I don't think so. I hope not."

"No more than I do," stated Hawley calmly.

"If you knew about this, why haven't you been doing something?" Stark demanded angrily.

"How do you know I'm not? Not that there's anything much to do—outside of trying to distribute glasses to replace the rose-colored dream-

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world of the zombies. That's effective, in one way, although it frequently leads to bloodshed. It's too slow and gradual for any real use. Actually, I'm not sure it's wise, with the kind of opposition we have in high quarters."

"Too little and too late again," wailed Stark. "How did the world ever get in such a mess?"

"Very simply, the same way it gets into most messes. We just drifted into it. Nobody guessed the menace until far too late to take any effective counter-measures."

"Who did it to us?" cried Stark. "What kind of mad monsters could have—"

Hawley laughed bitterly. "We're not sure about that. Maybe the same kind of mad monsters who always do us in—our own sweet, vicious, stupid, venal selves. It could have happened accidentally, spontaneously."

"That's crazy," burst out Stark wildly. "There has to be someone behind it. Some group of special-privileged people. Some enemy. Maybe even aliens from somewhere off the Earth."

"It could be. We don't know, frankly. Perhaps there are no masters—but only degrees of submission to group-hypnosis. Our people in the underground resistance movement have thought a great deal about the problem. We believe it could have happened spontaneously. We know that advertisers in their panicky rivalry for business set off a triggering action. By adding small amounts of hypnotic drugs to all their products—foods, drinks, medicine, even cosmetics—they put mankind into a stupor of narco-synthesis, open to the mass suggestion of TV commercials. 'Buy this—buy that!' the monster commanded, and the marching zombies went and bought, led over the cliffs by the Judas goats, announcers, players, animators of cartoon commercials. As they bought and used, drugged products monopolized most business dealing directly with people's needs. The vicious circle was complete. And people worked only to obtain money to buy more of the tainted products."

"That may have been the start," admitted Stark. "But too much has happened. Somewhere along the line someone—probably a special privilege pressure group saw opportunity and took over. I sensed a great deal of this subconsciously, even before the glasses opened my eyes."

"Combined drug addiction and mass hypnosis could be a frightful weapon in any hands," agreed Hawley.

"Ordinary advertisers and manufacturers would never have organized so tight and vicious a set-up as thought police, security police, and the Pushers. So somebody holds the reins. Who are the Masters?"

"I wish we knew. They would be easier to fight if we could break through the barrier and find someone, or a group, who are behind it all—someone profiting from the misery of the mesmerized mobs."

"Misery?" questioned Stark.

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"Yes, misery. They are miserable. They are subjected completely, but all their human instincts fight against it, so they are terribly disturbed."

"You're right. It's as vague as prolonged nightmare to me, but I must have guessed that something was terribly wrong. I felt an urge deep inside to fight back. That's the reason I reacted so violently when my personal chains snapped. How do these glasses work?"

"I don't know exactly. Something like polarization—enough distortion to break the spell of mechanical hypnosis. But even with glasses, it's difficult to break away. There are laws now requiring everyone to have daily access to TV. I bought myself a set. I even turn it on, in case someone is checking current flow. But I cover the screen, and try to preserve my sanity, my rights as a thinking individual."

"You were lucky, but you were an unusual type."

"Just a hardhead. The resistance movement was originally composed chiefly of people like me, with quirks against TV, quirks against regimentation, herd-ideas, standardization of entertainment, canned music, everything. After us came people with odd defects of vision. Somehow we got together and worked out the idea of glasses to help others break away. It's a slow process. Too slow."

"It's all right as far it goes, but—"

Hawley interrupted soberly. "Don't expect too much of us, Stark. We're a resistance movement, but pretty disorganized. Our new recruits are too frightened or confused to be much use. The rest are mostly stubborn crackpots like me, incapable of real discipline. Violence, yes, but not effective violence."

"That's logical, but discouraging. Not good material for a tight, well-organized army. Actually, of course, what we're all working against is too well-organized a discipline. Too perfect, and too complete. It's terrifying."

"Any real fighting is practically hopeless. We're like a man in a totally dark room fighting an unknown opponent. He may see in the dark, but we can't. And there's no use striking out at the slave victims, when we don't know their masters."

"I don't believe you've been thinking along the right lines," Stark observed critically. "I've been pretty busy for much thinking up to now. But just talking to you is giving me a glimmer of an idea."

"You know who the Masters are?"

Stark shrugged. "I'm not sure. But it almost has to be—"

The visiphone rang jarringly. Hawley waved Stark out of sight and tripped the switch. A small boy's face showed in the visiscreen. Hawley and his caller exchanged low, rapid words.

"Thanks," said Hawley, breaking off. He turned to Stark.

"The Pushers know you're back in the neighborhood. Have summoned reinforcements to make a building-by-building, room-by-room

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search. I'll have to get you out of here."

"That sounds rough. Where can I go?"

"There's a place. Not far. But damn' risky."

"I'm getting used to risks. Where?"

Hawley laughed sourly. "Right across the street, in your old building. We have a cell hidden there."

"I don't want to cause you or your people any trouble."

They exchanged glances, Hawley slightly flushed.

"You said something a while ago that flicked me on the raw. You're right, of course. We haven't been fighting back hard enough. And I think you might be the man to show us how. So let's have no more talk about getting me in trouble. I know the risks better than you do. I'm taking them."

Stark gave his friend's arm a warm pressure. "Check. No argument. What do you want me to do?"

Hawley studied Stark's impromptu disguise shrewdly. He made a few changes and additions.

"You got by with it before. It will have to do. This will be tougher, going into a building where your face is well known. Do you think you can bluff your way through the lobby?"

"I can try."

"Good. You'll go first. Walk straight in, head up, and try not to act suspicious or doubtful. Don't look to right or left. Go straight to the No. 2 elevator. Go inside and wait. I'll be right behind you. Once in that elevator and we're set."

"How about the elevator robot?" asked Stark.

Hawley chuckled. "He's a friend. We rewired his circuits."

Stark felt the pressure of many eyes turned toward him as he crossed the street. Nobody challenged him, although the area was swarming with uniformed police and Pushers.

He marched directly across and into the lobby of the building which housed his office-studio. That, too, swarmed with minions of authority. Stark moved steadily, head high, outwardly calm, seething inside, his heart hammering with strain, excitement. Halfway across he disobeyed instructions. He glanced upward at the building directory, partly from morbid impulse, partly to check his memory of the listings. His name was missing from the roster. Apparently the masters were already erasing his existence. His eye wandered over the names of other occupants, searching. Yes, near the bottom! Penthouse—Institute for the—

A stir of movement behind quickened his footsteps, urged him to the elevators. No. 2. He got in.

In seconds, a panting Hawley was beside him. The door slid shut in a clash of metal.

"Please call your floor clearly," commanded the robot voice.

"Hi, Charley!" said Hawley. The servo-mechanism audibly skipped a beat, then skirled. "Down, boy, down," said Hawley.

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"How far down?" asked the robot doubtfully.

"All the way down, and then some."

The cage started down and kept going. Indicator jammed at Sub Sub Basement. As far as Stark remembered, that was as far as the lower levels went. But the cage kept going. It stopped at least two hundred feet lower.

Stark followed Hawley into a huge gallery hewn from the solid rock. There were people, many people, all busy at curious tasks, all wearing glasses which shimmered mirrorlike, opalescent, reflecting the dim light.

"So this is the underground?" Stark mused aloud. "All the way underground, literally!"

"We didn't build these mole-warrens," Hawley explained. "They were here. Old. A regular network interconnecting bombproof shelters under the city. There's even pneumotube shuttles between this and other cities. Quite a set-up. And useful."

"It may be even more useful," said Stark.

"Come on! I'd like to show you around, but we've passed over some formalities. We're not supposed to bring anyone here until he's been cleared by the cell leader. I'll take you to Myra. She's in charge here, as much as anyone is in charge."

After prolonged exposure to the cliches of TV and tapezine cloak and dagger affairs, Stark expected Myra to be a slinky, sloe-eyed heroine of melodrama with sprayed-on evening gown and dripping jewels. Myra proved fiftyish, with a face like a slab of beef. She stood 6'2" in her stockings and weighed a good three hundred pounds.

"Myra," said Stark. "I remember you. But we called you the Duchess. You were a lady wrestler."

Myra laughed coarsely and spat. "I'm retired from wrestling, but I can still break the neck of any weasel who says I'm no lady." She glanced sharply at Hawley. "You shouldn't have brought anyone here without a clearance first."

"I know that. But there wasn't time. He got our glasses by mistake in another part of town. Nobody kept an eye on him and led him to us at the proper time. He did have sense enough to keep his mouth shut till the pressure got too much for him. Then he blew it all at once—and started running. They were right on his heels when he came to me."

"How'd he know about you?"

"He didn't. We're old friends. He came because he was hungry and had nowhere else to go. He still is. I'll vouch for him."

Myra considered the recommendation. "Don't I know you?" she addressed Stark. He writhed under her probing.

"Maybe you do. Jabez Stark, called Jay. Columnist and commentator on TV. Formerly, I should say. Right now, I seem to have upset a lot of applecarts. There's a price on my head. And I'm in just the mood to sell my head for a glass of milk and a sandwich."

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"We'll feed you," she told him. "Afterwards, if we don't accept you into the fold, we'll brainwash you, give you a new name and a fresh start back into a very stale world. Would you like that?"

"I wouldn't like it. I hate everything about the world as it is. I prefer to do my own thinking and feeling, such as it is. If you don't mind, I'll skip the brainwash and the new identity. If you can't use me, kick me out. I'll go on fighting, alone if I have to, in my own name."

"You sound all right," she granted. "But we have to be careful. They've sent other ringers to smoke us out. I'm afraid they may have caught onto the glasses deal. Can you prove you're who you say you are?"

Stark shrugged. "Only by documents which might be forged, only by the fact that I'm a hunted man, which could just as easily be a faked act. Hawley knows me, but he might have fallen a victim to the general hypnosis."

Myra pushed a button, summoning a boy who gave a mock salute.

"Bring Stark some grub. Pronto. Find Claire. Have her bring it."

"Claire's outside, waiting to see you. I'll send her for the food. It won't be fancy. Rations are low."

They waited, not talking. Stark's stomach growled in protest. Finally a slender, dark-haired girl, with wide, frightened eyes brought in a tray. The food was coarse, simple fare, but it looked like a banquet to Stark. He ignored the girl. Myra bent a finger at the girl.

"Is this the slob you got into trouble trying to locate your missing sister?" asked Myra.

"Yes, this is Mr. Stark . . . Jay." The girl turned to Stark, smiling sadly. "I'm sorry about that, Mr. Stark. I should not have involved you. I mean, by asking you to help find my lost sister."

"Forget it," Stark told her roughly to hide embarrassment. "I'd have been involved anyhow, sooner or later. And I had forgotten that it could be fun to be alive. To be in danger, taking risks and fighting for something. I'm actually beginning to enjoy myself."

"Have fun," urged Myra steadily. "This set-up of ours may blow sky-high any time."

"It will if people like you just sit on your hands and wait for trouble to happen," observed Stark critically. "Speaking as an outsider, I wonder if you really want to fight back. You must like this rats-in-the-walls existence of yours. I don't. I won't settle for that. I want to hit back hard where it will count."

Myra studied Stark with Olympian detachment.

"What would you do, Mr. Stark?"

"Oh, no," he snapped. "If I'm a working member of the group, all right. If not, I'll make my own plans and act on them. Alone, if need be. With a live organization if I can find one. It will be a big job. Not for sissies, or masochists."

Myra laughed solidly. "Big talk for a newcomer, Stark. Fighting talk, which is what I like. You're right.

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And I guess you're one of us. With Hawley and Claire both vouching for you, we can consider you a member of the family. The girl, I know, is not hypnotized, except possibly by your obvious male charms."

"Don't misunderstand me," said Stark. "You've done wonders under severe handicaps. I give you full credit. But you're still living under terms dictated by the enemy. You're not thinking in straight lines."

"We're just as impatient to retake our world as you are," argued Myra irritably. "But I don't think you realize how ramified and entrenched that enemy is."

"I should. I was part of it, only recently. A working part. Believe me, it can be licked. It's a line of dominoes. One push and the whole line topples, each one knocking down the next."

"A push in the right place, maybe. But where is the right place?"

"I've been thinking about that," said Stark. "Maybe I think better on my feet, even running. At least I worked oxygen into my brain. I have a hunch. It almost has to be right."

"You know who the Masters are?"

"I think I do. It's an educated guess. If I'm right, their dream world is about to be rudely shattered. And it won't take long to find out. My idea of the place to push is right in this building. After all, it houses a majority of TV studio-offices, like my own. Where better could they supervise their hypno-mechanism than right here?"

"You have a point," said Myra eagerly.

"There's a TV monitoring tower on top of the building," Stark went on, gathering momentum. "I've never seen it, but I know it's there. That will be their control station. And there's an Institute for Research Into Methods in the penthouse."

"It will be guarded like the mint," put in Hawley. "How many men will you need?"

Stark thought about it. "Not many. You and I, of course. And for an old heifer, Myra looks in pretty good condition. She'll be a help if necks need cracking. And we'll take Claire along for a margin of safety. The four of us should be enough, and if I'm wrong, and we are liquidated, it won't be a mortal blow to the resistance movement."

"How do we get up there?" demanded Myra.

"By elevator, obviously. Who rigged the rewiring job on the robot in elevator No. 2?"

"I did," said Hawley. "But I don't see what—"

"Were any of the others off standard, or did you look at them?"

"I did. I'm thorough. The robot on No. 3 had a trick circuit I couldn't figure. No reason for it."

"We'll use No. 3. You may have to doctor the robot. But I think it will take us up. I think it will take anyone up. They aren't expecting visitors. May not even be guarded."

Elevator No. 2 took them to the Sub Basement. They rang for No. 3 and waited. It came and the door

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slid smoothly open. They got into the cage and the door closed.

"Call your floor clearly," ordered the robot voice.

"All the way up," ordered Stark.

"Are you authorized?"

"Yes, we are authorized."

There was a jeweled moment of decision. Servo-mechanism whirred invisibly. The cage started up. It kept going, far beyond the listed floors of the building. Finally it stopped. Stark and his friends wondered where they were. How high?

The cage-door clicked, slid slowly, smoothly open.

Darkness yawned before them. There was a sensation of open air, of great space surrounding them. A sense of being high up, upon a small platform, suspended in space, partly open to the skies, to the cool night air.

But darkness was absolute. Darkness and silence.

Stark stepped boldly into the darkness. His voice challenged it.

"Where are you?" he inquired.

The response did not answer his question directly.

"So you have come at last," a voice said. A voice sad and lost and frightened. "It is all over?"

"All over," said Stark harshly. "Now that we know, we can topple your dynasty like a house of cards."

"Yes," said the voice. A murmuring as of many other voices caught up the sound repeating it like an echo. The first voice continued upon a solemn note.

"Yes, now that you know about us, you can break the spell. You can, and will, destroy all that we have worked for. You can bring back strife and rivalry and fear and hatred. You can bring back the natural savagery of mankind. You can loose the power to make war, the power to kill. You can destroy us . . . and mankind."

Stark spoke slowly, carefully into the darkness. "Man must take his chances with his own follies. Nobody can save him from himself. Perhaps you meant well, but have taken the wrong means. Man was not meant to dream away his life in slavery, in drugged and hypnotized stupor. Peace is wonderful, but not at the price of living death. We must take our chances as a thinking and decided animal. We must risk the thermo-nuclear bombs, the contraterrene explosives, the gravity displacement. We have to make our own choices or we cease to exist as men."

"You are right," agreed the voice from darkness. "But we meant no such harm. We have killed and injured no one. Even those who vanished were treated psychologically and returned to new surroundings to replace others who had disappeared."

"I believe you. But you must end this domination of all humanity. You must end it, or there will be killing. There will be violence beyond your imagination. Mobs will break in here and scatter your torn flesh from the rooftops."

"It is ended," said the voice. "We

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saw an opportunity to grasp a dream. We were fools. So the dream ends . . ."

"Let the dream die," snapped Stark angrily. "It has already turned into nightmare."

In the darkness there was rustling movement. Stark and his friends heard the click of a switch. Light flooded the partly open platform in the tower high above the city. Seated around at monitoring desks, with curiously raised figures instead of visual images were the Masters.

It was logical when one thought about it.

The Masters were blind . . . .

ASTRONOMY IN ANCIENT CHINA

China has the oldest notices of sunspots, observed as the sun was just rising. Systematic records tell of 101 such phenomena occurring between 28 B.C. and the end of the 16th Century. Europeans had likewise observed them, but did not realize they were a part of the sun until the 17th Century, after Galileo's observations.

Chang Heng (A.D. 78-139), one of the great intellects of Ancient China, was a contemporary of the famous Graeco-Egyptian astronomer Ptolemy. Chang Heng propounded the revolutionary theory that the universe is infinite in space and time. The earth, he said, was at the centre, suspended like the yolk in an egg. Basing his observations on the position of the stars as seen from the Han Dynasty capital of Loyang, in Honan province, he regarded the Polar Star as one end of the axis on which the great spere of the sky revolved over and about the earth. This was his explanation of the apparent movement of the sun about the earth.

Also a great painter, he fought against the older Chinese idea that the earth was flat and the sky a dome.

Chang Heng invented the armillary sphere, a kind of celestial globe on which metal rings represented the paths of the sun and other celestial bodies. Powered by a water-clock, a time keeping device which had been developed much earlier in China, it could be called the world's first planetarium. He used to delight visitors by showing them movements on the machine identical with those in the sky. He also invented a bronze seismograph, for detecting earthquakes.

Chang Heng was the first man in China to view the moon as a non-luminous body reflecting the light of the sun. Eclipses of the moon, he explained, were caused by the shadow of the earth upon it.

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survival in space

by . . . Lester del Rey

Space is still a frontier—perhaps pioneering methods do work best and spell ultimate survival of the race.

I'VE BEEN scanning the papers busily, looking for the one U. S. government project which seems the only logical direction for our space program to head. But so far, there seems to be no news that anyone is seriously studying the problem of microminiaturizing the human animal.

This seems a shame. There is no other field in engineering where we have so clear a supremacy as we have in making smaller and smaller parts to do a full job. Recently, for instance, we have announced that we've developed parts for satellite instrumentation so small that 750,000 of them could be put into a single cubic foot of space! This is an even more incredible achievement than building a complete satellite for Vanguard which would weigh only a trifle over three pounds.

Against such a development, the human frame is obviously a gross example of inefficiency. So far, nobody has come up with a viable human adult less than thirty inches tall and weighing perhaps forty pounds. If the human body could be reduced proportionately to the reduction in resistors, capacitors and

Lester del Rey, well-known writer and editor, author of the recent ROBOTS AND CHANGELINGS, *and of the earlier* NERVES *(both Ballantine), and also* ROCKETS THROUGH SPACE *(Winston, $3.95) turns to the question of survival in space in his latest article on the problems we face as we enter the Space Age.*

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amplifiers I've witnessed, we might wind up with a whole crew plus supplies in something the size of Explorer.

This is impossible, of course. But it might be possible in time, through micro-miniaturization, to build micro-manipulators (waldos, to use the correct name that was borrowed from science fiction) and micro-television instruments. Through the use of these, a man on the ground would effectively be in space. And in that way, obviously, the personal survival of the pilot would be no problem at all.

Then we could send our tiny vehicles up into space, make the fullest use of them for observation —including inspection of fission and fusion explosions—and bring them back to earth by guiding them into a landing orbit.

It would give us everything from space that we seem officially to want, except for one detail. Through such robot miniature observers, we could study the weather as effectively as by the use of manned stations. We could even manage television relay stations that would permit one master transmitter to serve slave transmitters over the hemisphere through broadcast to space and back, without any line-of-sight limitation. (This, of course, is clearly worthwhile; it involves no waste for basic research, but would effect an actual saving in the price of sending Captain Video's Space Rangers across the country). It would work in well with our projected "Pied Piper" observers, designed to spy out all activities on Earth for our military protection.

It might not satisfy some of the science fiction and rocket fans, but there is no provable value to be gained *yet* from sending men out to the Moon and the planets. From a strictly practical or military point of view, remote-controlled satellites will do almost everything needed for much less expenditure of money and effort.

Russia, of course, has taken a different attack on things. Here, Russia shows the signs of the bull-it-through, brute-strength attitudes of pioneers, while we have left these behind for more refined techniques. Russia is still young in science and technology, more inclined to rush in and strike out before examining all the angles. She's still hewing out houses from the trunks of trees with hand-axes, while we've learned to dovetail five rooms and bath into 600 square feet of thin-walled, plastic and glass houses. She's even guilty of wanting to do things—like a young child—just to show she can. But, after all, space is still a frontier; perhaps pioneering methods work best on the frontiers.

At any event, while I hear rumors that we're building a 300 pound Explorer, I can look up into the sky and see Sputnik III—all 3000 pounds of it, not including the carrier. The Soviet engineers have proved vastly inferior to us in miniaturization techniques, but they've made up for it by sheer power.

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With only a slight relative increase in size—representing less progress than she's already made in a few months—Russia could put up a man-carrying satellite. Our date for our first exploration of the possibility of this is set for about 1962; my guess is that Russia will have men in space long before the end of 1960.

I've got a favorite nightmare about the difference in possible developments, and I'm glad to share it here. It seems that this is 1961, and we've made excellent progress. Our miniaturization is the marvel of the planet, and we are now able to put up 30 pound satellites fully equipped for remote control. I'm down on Earth, running one, seeing through its telescreen, controlling its functions through waldos—practically out in space myself, though in complete comfort. I feel pretty good. I wear my spaceman's uniform, and I'm about to be promoted. (I'd be a Captain now, but I once let a commercial on the television relay channel get garbled.)

Then something enters my vision from the edge of the screen. It's one of the gross, huge Soviet satellites—ten ton monsters, she's using now. It's coming up on a collision path! Frantically, I reach out my waldos for the tiny controls to jet out of the way, swearing because this will reduce my supply of miniaturized fuel for my final re-entry.

But the big satellite turns, too! Is this an attack? Are they trying to blast my remote out of space? But no, they simply match orbit alongside. A grapple comes out, and I'm shocked numb as my remote is drawn through an airlock and into a cabin bigger than the room in which I work. Six grinning men stare at me—or at my telescreen—while hands reach out for me.

Then an officer enters and bellows in Russian—which I understand in my dreams: "Okay, okay. Put it back where you found it! You guys trying to start an incident?"

So the grapples lift me again and thrust me toward the airlock and my orbit. But before I am completely out, I hear one of the men make a final comment: "Cute, ain't it? Real cute!"

So I wake up screaming.

When the magnificence of our progress, the grandeur of our concepts, the sweeping vastness of our ambition (get those adjectives we use as clichés) become merely "cute" to the rest of the world, we'll have had it as a prestige nation. We might as well fold our tents, very unlike the Arabs, and silently steal away.

That nightmare will never happen. Undoubtedly, officials have had nightmares not too unlike it, and have realized that our national prestige cannot stand the reality. So something will be done, and we will undoubtedly put men—not robots—out into space. Our plans, as outlined by James B. Edson in "Astronautics and the Future" (*Bulletin of the Atomic Scientists,* March 1958), call for biological readings

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to put men into space and the training of men for space study by 1962. Then, sometime between 1963 and 1967, the final stage of development is to occur—we hope to launch satellites of 5000 pounds payload into space, probably carrying men. Whether or not the Russians will watch such a launching from their space station by then, the plan does not say. But at least there is a definite intention to get men into space.

Can we survive in space, once we get there? Well, as in the case of so many words that are used about space travel, *survival* has a couple of related but different meanings. One applies to outlasting (difficulties, enemies, etc.) or enduring; the other applies merely to remaining alive or existing. Let's take the short-range angle first, and merely ask if men can remain alive in space.

The answer to this is both more certain and more doubtful now than it was a few months ago. The problem of the survival of a crew of men in a spaceship has been given extremely careful study for several years. By now, most of the dangers and difficulties have been examined pretty thoroughly, and the results of the first steps into space—Explorers, Vanguard and Sputniks—have been added to the data we have.

The first problem will be the acceleration needed to put the satellite or ship into orbit. For economy of fuel consumption, the take-off must be at fairly high levels, with a force equal to several times the gravity pull (g) of Earth. This may reach 9 g briefly on the first stage, 7 g in the second, and less in the following stages. At no time, however, will the men be subjected to more than 5 g for longer than one minute. This may seem pretty rough; pictures at such a level show men with faces pulled back like wax images melting in an oven from the strain of five or more times the normal pull on the flesh. It looks discouraging.

Actually, it isn't so bad, apparently. When lying prone, men have already taken as much as 17 g for a minute without even blacking out! The men who will be trained on centrifuges for the trip will remain conscious and will sustain no harm during the trip up; and since landing will involve very low thrusts, there will be no trouble from acceleration after they get into space. We can say for certain now that we can handle the acceleration without difficulty.

The absence of any pull or gravity effect is another matter. Once the rocket motors are cut off, there will be no feeling of gravity at all; this applies, no matter how far from or near to Earth the ship may be. Gravity will still reach them, but they won't feel it. We can feel the resistance to gravity—not the thing itself—and there will be no resistance, since men and ship will be equally pulled or slowed by gravity. They will float quite freely without apparent weight (but with unchanged inertia, or resistance to

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change of motion) from the moment the rocket thrust ends.

We can't test this too well, yet. We can put a plane into "free fall" conditions for a very brief time, and we have run tests this way; but it only lasts for a couple minutes or so. From these tests, it seems that some men can take it, but others get an automatic panic reaction, and cannot. By weeding out the ones not equipped for free fall naturally, we can pick crews capable of emotional acceptance of zero-*g* for at least a few minutes.

Whether they can learn to orient themselves easily by using other senses when the balance organs in the ears stop working (since these operate by gravity only) is in some doubt; probably the answer is that they can. Also, while we can't be sure, it now seems that men can learn to take the weightless feeling for long periods. This may be most difficult while sleeping, when the instinctive falling fear will probably produce some lovely nightmares. Never having had a literal nightmare in my life—only literary ones to make a point, as the previous one—I can't say how bad that would be.

However, we have some experience with the other great instinctive fear—the fear of loud noises shown by babies; having seen a baby master this in five days and sleep through what would have made it awake screaming three days before, I doubt that the falling fear in dreams will be too bad. (Work with dogs isn't conclusive here, since it may be that only tree-dwelling species have this fear.)

Aside from the balance sense, man is otherwise well equipped already to live without weight. Unlike some animals, he can swallow in any position, even upside down against gravity. His blood-pressure will adjust automatically to sudden changes, and his digestive system is highly adaptable. Given handholds, water in plastic squeeze bottles, some reasonably elementary sanitary devices, and fans to keep the air circulating without gravity, and he should make out fairly well. Even the problem of giving a feeling of orientation may be solved by the careful use of colors to suggest up and down; we're used to darker colors below, lighter above, for instance, and color psychology may indicate even better solutions.

A lot of needless worrying has been done in the past about how to keep the spaceship at a comfortable temperature. A number of articles have appeared, explaining that heating is no problem—heat is easily supplied—but worrying about how to keep the crew cool enough.

The answer given by the satellites so far seems surprising to some: there really is very little problem. The inside of the satellite seems to have maintained itself at a temperature range well within the limits of human tolerance.

Why this should be surprising, I'm not sure. After all, the satellites are the same distance from the

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sun as is Earth, and it seems fairly logical that their temperature should not be too greatly different from the average temperature of the planet. The Earth's outer layer reflects and distributes the solar radiation, but so can the skin of the ship.

A crew of men in a small space, together with energy-using machinery and instruments, will generate a fair amout of heat; but by shielding out more of the solar radiation at the surface, the temperature can still be controlled; thermostatic devices can regulate the shielding to provide quite equable temperatures.

This final unnatural physical state of space, so far as men are concerned, is the lack of air around them. Food can be carried easily enough, and water will tend to accumulate, since the human body produces a surplus af water in burning up its food. A simple system of pipes to move water to the hot side where it would vaporize, then condense the vapor in the ship's shadow, would produce an abundance of absolutely pure water. But air is another matter.

Probably they will carry only oxygen, the 20% of normal air that has any use for us. By using a lower pressure and a higher percentage of oxygen in the ship, the lungs will secure the normal amount of oxygen without the added weight of other gas. A man needs only about twenty pounds of oxygen a week, which isn't too difficult a problem of supply, even allowing for the weight of the tanks to hold it.

Unfortunately, it isn't simply a matter of replacing the oxygen the men use up. The air or oxygen has to be kept fit for breathing in other ways. In a closed room where people live, the problem of odors can be a serious one; the nose will become deadened to them, but they can still produce unease or even headaches. This may be taken care of to some extent by the dehumidifier that removes water from the air—perhaps another tube on the ship in a shadowed area. But it's a problem that seems so far to have received scant attention. It certainly can't be solved by the "air purifiers" we spray from cans, since an accumulation of scent-deadening formaldehyde, or whatever, won't be desirable. And in spite of the ads, chlorophyll by itself won't really do the job. Probably for the first few short trips, it won't prove too serious a problem, and I'm sure answers can be found.

A tougher job will be that of removing the carbon-dioxide from the air. This gas isn't really a poison; a small amount is needed to keep our automatic breathing apparatus working properly. But too high a concentration will cause sickness, rapid breath and pulse, and eventually unconsciousness and death. If the concentration is too great in the air, the blood can't pass it out through the lungs easily, and the accumulation can be fatal. Normally,

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this should be kept well under 1% concentration in the air.

This gas can be absorbed by certain chemicals and changed to inert compounds. Any alkali solution through which air is bubbled will remove it in the form of carbonates, since CO_2 and water produce carbonic acid, which reacts with the alkali. The classic demonstration of this is by blowing through a straw dipped into lime-water; the exhaled breath forms a white cloud of calcium carbonate precipitate. But at best, this method of absorbing the CO_2 adds considerably to the weight of the ship—probably the alkali apparatus used would equal three times the actual weight of the oxygen consumed!

This problem is discussed in some detail in a recent paper published by the American Rocket Society, "Human Factors and Space Cabin Development", by Eugene B. Konecci, Ph.D., Head, Human Factors Group, Douglas Aircraft Company, Inc.

Dr. Konecci suggests the possibility of another method of removing the CO_2—and restoring the oxygen to the air. This involves passing slightly moist CO_2 gas across a catalyst—a fine copper mesh screen — while irradiating it with ultra-violet light. The results show a definite breakdown of CO_2 and release of oxygen.

Since the sun itself might well serve as the source of UV light above the ozone layer (which normally absorbs most UV light), this method looks promising. But so far, the results are not sufficient, apparently. The breakdown is still fairy inefficient, from the graph included with the paper. Further investigation is certainly indicated. Perhaps with other catalysts or with a method of using much finer copper, to provide a greater surface for its work, a greater efficiency could be achieved; at least, such has usually been the case in other catalytic reactions.

Science fiction, for the past twenty years or so, has been suggesting still another answer—the use of plants to replenish and purify the atmosphere. Plants can convert both the CO_2 and the water produced by animal use of food, releasing all the oxygen back into the air. Certain plants, such as chlorella (green algae) are quite efficient at this, and experiments are now being conducted into this by the Air Force School of Aviation Medicine.

Dr. Konecci covers this briefly, but dismisses it for the present as impractical because it requires 80 cubic feet per man for the apparatus and plants. Apparently, it is hoped to bring this down to 40 cubic feet—4' x 5' x 2'—but this has not yet been achieved. These figures are a great deal more pessimistic than some I have seen set down by others as currently possible. But certainly problems are involved here, such as how to operate chlorella tanks at zero-gravity. For a space station, certainly, the plant system will be desirable. Whether it can be worked

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out for the early ships is another matter.

It seems that some of our skill at miniaturization is badly needed here.

It remains a problem, but there are solutions we can already apply—not ideal, but workable—so this is not a major obstacle to manned space flight.

This all seems reasonably optimistic, and there is more optimism merited in some ways when we consider the old bugaboos of meteorites and radiation in space. All indications from the satellites are that the meteorites are tiny enough generally and that larger ones are so infrequent that a simple meteor bumper—a false skin of thin metal—around the ship would be ample protection. As for cosmic radiation and other dangers, the latest results there are less forbidding than we had expected. Apparently, out in true space the amount of cosmic radiation isn't beyond the levels we can stand for some time. (And with certain drugs now developed to aid in eliminating damaged cells, this level of our tolerance may increase a great deal.)

However, here the picture takes on a new and more pessimistic nature where we hadn't expected it. The satellites show a zone of intense radiation of some kind at a height of about 600 miles above Earth. Just what it is, we don't know, though it is probably some result of solar radiation, and is related to the ionization that produces the aurorae. Like the old fear of cosmic rays, this is producing wild speculation and considerable discussion of the need for shielding. But nobody has yet said it was an insuperable difficulty, and it may only mean that we'd better put our ships up quickly into a higher and safer level.

When all is said and done, we *know* that life can survive for a time, even in this zone of radiation. Laika established this beyond question. The Russian reports indicate that she did fairly well for a week. There was a period after the end of acceleration when her pulse and blood pressure showed disturbance—probably because she was used to being released and petted immediately after her trial accelerations in a centrifuge, and was waiting expectantly for it this time. Then things went back to pretty much normal, and no indications of difficulty in her adapting to space were seen. Men, who know what to expect and why things happen, should do far better.

In one area, however, this does not apply. The eternal cussedness of man creates a final problem, this time largely psychological. Cabin fever is an old diffculty, and the cabin here is going to be more confining than almost any other. Even submariners in the older ships—who had to be carefully picked for character traits—had less trouble than our space crew may find in this way. Hence, the maximum attention must be given to making this small space as suitable for human use as possible —and such studies of cabin design

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are being made. (Again, Dr. Konecci touches on this in his paper.)

Unfortunately, however, the one case brought before the public was largely meaningless. The Air Force recently made a great splash in the papers by putting a volunteer into a sealed cabin and "sending him into space," according to the press releases—that is, simulating conditions as best they could. After several days, he came out and was billed all over television and the papers as the "space man" until other factors ended the publicity.

Obviously, this didn't have a damned thing to do with the real problem of what men must stand in space. There was no danger; no psychological realization of being out in something man had never dared before; no radiation indicated by his instruments to worry him; no problem of re-entry; no duties beyond reporting—an aid to clinical detachment; no absence of gravity, obviously, with its accompanying phenomena; no new sights. And there wasn't even a confinement of several men together where they couldn't get out at a moment's signal to relieve the strain.

It was a fine publicity holiday and probably had some real value. But if that man could talk about "going into space," think of what we could learn from anyone who has lain strapped in bed under an oxygen tent for a week! Or think of all the people who have been in iron lungs. If you want to see "space men," I think it might be wiser to interview some wards in hospitals. Those come much closer to showing what the human animal can endure when he feels he must. Or interview some of the older submariners who were trapped for a time below the sea in their cramped little "space ships."

From such examples, and not from the results appearing in the press about space and "space men," I think it can cafely be said that men will and can find ways to stand the rigors —both physical and psychological— of space travel. We can send men out into space in time, and it seems fairly certain that they can survive the trip and return.

But can we survive in space in the long-range sense? Can we—our nation—outlast the difficulties, endure the early stages, and survive into a true utilization of that limitless frontier?

There, I wish the answer were a little clearer than it seems to be. I think that answer depends largely on how long it takes us to get out there in person.

Mankind can do it, I feel sure. Mankind could and did survive in the New World. But some of the nations which originally got into the race for America did not survive here. France, England, Spain and Portugal alone left any real mark; Denmark and Holland simply were too small. And Russia—a vast country with resources that might have won much of the new world—failed completely. She got here—from Alaska down to settlements in

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California—but too late and with too little. Mankind survived here, but Russia did not.

Conceivably, the same in reverse might happen in the near future in the conquest of space.

Nobody is going to keep us out of space at any time. For a number of reasons, warfare in space isn't worth the effort, and the territory is simply too vast to police. There'll be room for us, even a hundred years from now.

But to what point?

Does anyone set out today to fly across the Atlantic as Lindberg did? Of course not. It's ridiculous and totally without reward to do what is being done commercially every day.

Likewise there comes a point where the achievement in anything is no longer worthwhile, because someone else is doing it regularly. You don't do experimental work in making something that can be bought on the market, nor explore a settled, civilized country. You don't start a new railroad across the country today.

At the present and for some time to come, there is a great deal of prestige and knowledge to be gained from going out into space; space stations would be worth ten times their immense cost, and several explorations of the Moon are badly needed.

But wait a few more years, and this will no longer be true. The first manned spaceship won't use up all the prestige, but the fiftieth won't excite much admiration, even if Pitcairn Island sends it up, except as a pure stunt. The first space station will be a tremendous feat, but the third or fourth can only duplicate efforts—it would be far simpler and more sensible to arrange for "diplomatic" exchange of scientists onto an existing station. The first or even second Moon expedition will be stirring, but after a couple of trips, the base established by that early effort will make it impractical for others to compete for glory. Besides, the first space station will help to determine who can build ships for the trip.

For a long time, there will be only three things to be gained from space travel: prestige, which has a time limit; abstract knowledge, which is most pursued by those who find other advantages; and practical returns such as military observation, weather studies, etc., which can be borrowed from anyone already there or achieved without manned flight. Perhaps in the far future, a strange type of colonization may prove to be the greatest advantage of all, but that is too far away to prove an incentive now.

Conceivably, we could continue to lag Russia in the exploration of space and the building of large rockets until her development had reached a stage where we could no longer derive enough benefits from any program of our own to justify it.

How long would this take? Nobody knows, of course. But the lag cannot cover too many years. From the first manned flight to regular trips

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is not too great a step; the move toward a station is smaller, because of the practical advantages that would hasten this; from there to the Moon is a short step. The history of progress in any new field shows that after the first efforts, development follows development at a rapidly increasing speed. The further Russia gets before we begin to narrow the gap, the more difficult it will be to catch up.

This has already begun to be apparent. We are effectively further behind now than we were in October 1957 when the first Sputnik went up. At that time, we had already at hand the whole Vanguard project, almost ready to be fired; and we had the Jupiter-C that carried up Explorer I. Nothing new was needed except the will to do. True, Explorer's 30 pounds was much less than that of the 186 pound Sputnik. But our superior miniaturization of instruments made the difference relatively small.

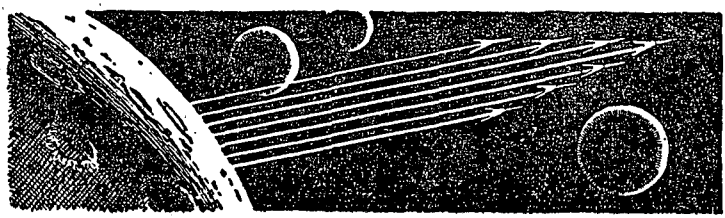
Today, we have vast amounts of plans for things to do. But the only tried and tested launching vehicles we have are the same ones that sent up Vanguard and Explorer. Meantime, the Russians have spanned a tremendous distance toward manned flight by designing a launching rocket that would get 3000 pounds into orbit—more than fifteen times the size of their first effort, and surely not less than a seventh of the size needed for man-carrying craft.

Perhaps behind the scenes we are catching up. But there is no evidence of this. And there is evidence that our first grim determination to do so is evaporating; we have even let our great plans for boosting our educational system decay slowly into a few vague speeches without any "implementation."

If we're willing to face our real and near dangers and if we'll make a real drive to meet the challenge, we almost certainly can survive in space in both senses of the word.

But if we lay waste our powers; if we spend too much time making sure that our rocket ships are ultimately refined, or crew cabins completely comfortable; if we spend too much time worrying about how well our pilots can survive the trip into space—

Then our chance for long-range survival in space is something not even worth discussing here.



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symposium of the gorgon

by . . . Clark Ashton Smith

It was a dangerous thing to be there in the palace of Medusa—as she died—and equally dangerous later . . .

At the third cup I penetrate the Great Way; A full gallon—Nature and I are one.

—Li Po

I DO not remember where or with whom the evening had begun. Nor can I recall what vintages, brews and distillations I had mingled by the way. In those nights of an alcoholically flaming youth I was likely to start anywhere, drink anything and end up anywhere else than at the port of embarkation.

It was therefore with interest but with little surprise that I found myself among the guests at the symposium in the Gorgon's hall. Do not ask me how I got there: I am still vague about it myself. It would be useless to tell you even if I could, unless you are one of the rare few elected for similar adventures. And if you are one of these, the telling would be needless.

Liquor brings oblivion to most; but to certain others, enfranchisement from time and space, the awareness of *Tao*, of all that is or has ever been or will ever be. By liquor I mean of course the true essence poured from the *Dive*

Clark Ashton Smith, poet and short story writer, author of THE STAR TREADER AND OTHER POEMS *(published in 1912),* GENUS LOCI, OUT OF SPACE AND TIME, *and* LOST WORLDS, *is perhaps best known as the creator of a mythos second only to Lovecraft's—the world of the Book of Eibon.*

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Bouteille. But, on occasion, any bottle can be divine.

Just why, at that particular time, after what must have been a round of mundane barrooms, I should have entered the mythologic palace of Medusa, is a matter hardly apparent but determined, no doubt, by the arcanic and inflexible logic of alcohol. The night had been foggy, not to say wet; and on such nights one is prone to stray into the unlikeliest places. It was not the first time I had gotten a little mixed up in regard to the Einsteinian continuum.

Having read Bullfinch and other mythologists, I had small difficulty in orienting myself to the situation. At the moment of my entrance into the spacious early Grecian hall, I was stopped by a slave-girl attired only in three garlands of roses arranged to display and enhance her charms. This girl presented me with a brightly polished silver mirror the rim and handle of which were twined appropriately with graven serpents. She also gave me a capacious wine-cup of unglazed clay. In a low voice, in the purest Greek of pre-Euripidean drama, she told me the mirror's purpose. The cup I could fill as often as I pleased, or was able, at a fountain of yellow wine in the foreground, rilling from the open mouth of a marble sea-nymph that rose from amidst its bubbling ripples.

Thus forewarned, I kept my eyes on the mirror, which reflected the room before me with admirable clearness. I saw that my fellow-guests—at least any who possessed hands—had also been considerately equipped with mirrors, in which they could look with safety at their hostess whenever politeness required.

Medusa sat in a high-armed chair at the hall's center, weeping constant tears that could not dim the terrible brightness of her eyes. Her tonsure of curling serpents writhed and lifted incessantly. On each arm of the chair perched a woman-headed, woman-breasted fowl that I recognized as a harpy. In other chairs, the two sisters of Medusa sat immobile with lowered eyes.

All three were draining frequent cups served with averted eyes by the slave-girls, but showed no sign of intoxication.

There seemed to be a lot of statuary about the place: men, women, dogs, goats, and other animals as well as birds. These, the first slave-girl whispered as she passed me, consisted of the various unwary victims turned to stone by the Gorgon's glance. In a whisper lower still, she added that the fatal visit of Perseus, coming to behead Medusa, was momentarily expected.

I felt that it was high time for a drink, and moved forward to the verge of the vinous pool. A number of ducks and swans, standing unsteadily about it with wine-splashed plumage, dipped their beaks in the fluid and tilted their heads back with obvious relish. They hissed at me viciously as I stepped among them. I slipped on their wet droppings and plunged hastily into the

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pool but still retained the cup and the mirror as well as my footing. The fluid was quite shallow. Amid the loud quacking of the startled birds and the giggling of several golden-tressed sirens and russet-haired Nereids who sat on the farther edge, stirring the pool to luminous ripples with their cod-like tails, I stepped forward, splashing ankle-deep, to the marble sea-girl and lifted my cup to the yellow stream that issued from her grinning mouth. The cup filled instantly and slopped over, drenching my shirt-front. I drained it at a gulp. The wine was strong and good, though tasting heavily of resin like other antique vintages.

Before I could raise the cup for a second draft, it seemed that a flash of lightning, together with a violent wind, leapt horizontally across the hall from the open doorway. My face was fanned as if by the passing of a god. Forgetting the danger, I raised my eyes toward Medusa, over whom the lightning hovered and swung back with the movement of a weapon about to strike.

I remember my mythology. It was indeed the sword of Perseus, who wore Mercury's winged shoes and the helmet loaned by Hades which made him invisible. (Why the sword alone should be perceptible to sight, no myth-maker has explained). The sword fell, and the head of Medusa sprang from her seated body and rolled in a spatter of blood across the floor and into the pool where I stood petrified. It was a moment of pandemonium. The ducks and geese scattered, quacking, honking madly, and the sirens and Nereids fled shrieking. They dropped their mirrors as they went. The head sank with a great splash, then rose to the surface. I caught a sidelong flick of one dreadful agonized eye—the left—as the head rolled over and soared from the water, its snaky locks caught in an unseen armored grip by the pursuing demigod. Then Perseus and his victim were gone, with a last lightning flash of the sword, through the doorway where the nymphs had vanished.

I climbed from the reddening pool, too dazed to wonder why I still retained power of movement after meeting the Gorgon's eye. The slave-girls had disappeared. The trunk of Medusa had fallen forward from its chair, upon which the harpies still perched.

Beside Medusa stood a beautiful winged white horse, dabbled from hoofs to mane with the blood that still ran from the fallen monster's neck. I knew that it must be Pegasus, born of her decapitation according to myth.

Pegasus pranced lightly toward me, neighing in excellent Greek:

"We must go. The decrees of the gods have been fulfilled. I see that you are a stranger from another time and space. I will take you wherever you wish to go, or as near to it as possible."

Pegasus kneeled and I mounted him bareback, since he had been born without saddle or reins.

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"Cling tightly to my mane. I will not unhorse you," he promised, "whatever the speed or altitude of our journey."

He trotted out through the doorway, spread his shining wings on an orient dawn, and took off toward the reddening cirrus clouds. I turned my head a little later. An ocean lay behind us, far down, with raging billows turned to mere ripples by distance. The lands of morning gleamed before us.

"To what period of time, and what region?" asked Pegasus above the rhythmic drumming of his wings.

"I came from a country known as America, in the 20th century A.D.," I replied, raising my voice to reach his ears through the thunder.

Pegasus bridled and almost stopped in mid-flight.

"My prophetic insight forbids me to oblige you. I cannot visit the century, and, in particular, the country, that you name. Any poets who are born there must do without me—must hoist themselves to inspiration by their own bootstraps, rather than by the steed of the Muses. If I ventured to land there, I should be impounded at once and my wings clipped. Later they would sell me for horse meat."

"You underrate their commercial acumen," I said. "They'd put you in a side-show and charge a stiff entrance fee. You're well known, in a way. Your name and picture are on sideboards at many gas-stations. A synonym for speed if nothing else.

"Anyway, there is little inducement for me to return. I have been trying to drink myself out of it for years and decades. Why go back, after escaping? Why end up, as I will sooner or later, at the highly expensive mercy of doctors, hospitals and undertakers?"

"You are certainly sensible, will you indicate a place and period more to your liking?"

I mused awhile, reviewing all I could remember of both history and geography.

"Well," I decided at last, "some South Sea island might do, before the discovery by Captain Cook and the coming of the missionaries."

Pegasus began to accelerate his flight. Day and darkness shuttled by, sun, moon and stars were streaks above, and the regions below were blurred by inconceivable speed, so that I could not distinguish fertile from desert, land from water. We must have circled the earth innumerable times, through the birth and death of millenniums.

Gradually the speed of the winged horse decelerated. A cloudless sun became stable overhead. A balmy subtropic sea, full of green islands, rolled softly on all sides to the horizon.

Pegasus made an easy landing on the nearest island, and I slipped dizzily from his back.

"Good luck," he neighed. Then, stretching his wings once more, he soared toward the sun and disappeared with the suddenness of a time-machine.

Feeling that Pegasus had aban-

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doned me in a rather summary fashion, I peered about at my surroundings. At first sight I had been left in an uninhabited isle, on a coral reef lined with untrodden grass and rimmed with pandanus and breadfruit trees.

Presently the foliage stirred and several natives crept forth. They were elaborately tattooed and armed with wooden clubs studded with sharks' teeth. Judging from their gestures of fear and wonder, they had never seen a white man or a horse of any color, winged or unwinged. They dropped their clubs as they neared me, and pointed questioning fingers, a trifle shaky, at the skies where Pegasus had vanished.

"Think nothing of it," I said in my suavest and most reassuring tones. Remembering a vague religious upbringing, I made the sign of benediction.

The savages grinned shyly, displaying an array of filed teeth only less formidable than the sharks' incisors and molars that decorated their clubs. Plainly they were losing their fear and making me welcome to the island. Their eyes appraised me with inscrutable blandness, like those of innocent children who expect someone to feed them.

I am pencilling this account in a small notebook found in one of my pockets. Three weeks have passed since Pegasus left me among the cannibals. They have treated me well and have fattened me with all the abundance that the isle affords. With taro and roast pig, with breadfruit, cocoanuts, guavas, and many unknown delicious vegetables. I feel like a Thanksgiving turkey.

How do I know they are cannibals? By human bones, hair, skin, piled or strewn about as animal remnants are in the neighborhood of slaughter-houses. Apparently they have moved their feasting places only when the bones got too thick. Bones of men, women, children, mixed with those of birds, pigs and small four-footed creatures. An untidy lot, even for anthropophagi.

The island is of small extent, perhaps no more than a mile in width by two in length. I have not learned its name and am uncertain to which of the many far-flung archipelagos it belongs. But I have picked up a few words of the soft, many-vowelled language — mainly the names of foodstuffs.

They have domiciled me in a clean enough hut, which I occupy alone. None of the women, who are comely enough and quite friendly, have offered to share it with me. Perhaps this is for therapeutic reasons—perhaps they fear I might lose weight if I were to indulge in amorous activity. Anyway, I am relieved. All women are cannibalistic, even if they don't literally tear the meat from one's bones. They devour time, money, attention, and give treachery in return. I have long learned to avoid them. Long ago my devotion to drink became single-hearted. Liquor at least has been faithful to me. It requires no eloquence, no

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flattery, no blandishments. To me, at least, it makes no false promises.

I wish Pegasus would return and carry me off again. Truly I made a chuckle-headed choice in selecting one of the South Sea isles. I am weaponless; and I don't swim very well. The natives could overtake me quickly if I stole one of their outrigger canoes. I never was much good at boating even in my college days. Barring a miracle, I am destined to line the gizzards of these savages.

The last few days they have allowed me all the palm-wine I can drink. Perhaps they believe it will improve the flavor. I swig it frequently and lie on my back staring at the bright blue skies where only parrots and sea-birds pass. I cannot get drunk and delirious enough to imagine that any of them is the winged horse. And I curse them in five languages, in English, Greek, French, Spanish, Latin, because they cannot be mistaken for Pegasus. Perhaps, if I had plenty of high-proof Scotch and Bourbon, I could walk out of this particular time-plexus into something quite different . . . as I did from modern New York into the ancient palace of Medusa.

Another entry, which I hardly expected to make. I don't know the day, the month, the year, the century. But according to these misguided islanders—and mine—it was pot day. They brought out the pot at mid-morning: a huge vessel of blackening battered bronze inscribed around the sides with Chinese characters. It must have been left here by some far-strayed or storm-wrecked junk. I don't like to conjecture the fate of the crew, if any survived and came ashore. Being boiled in their own cooking-pot must have been a curious irony.

To get back to my tale. The natives had set out huge quantities of palm-wine in crude earthen vessels, and they and I were getting ginned up as fast as we could. I wanted a share of the funeral feast, even if I was slated to afford the *pièce-de-résistance.*

Presently there was a lot of jabbering and gesticulating. The chief, a big burly ruffian, was giving orders. A number of the natives scattered into the woods, and some returned with vessels full of spring-water which they emptied into the pot, while others piled dry grass and well-seasoned fagots around its base. A fire was started with flint and an old piece of metal which looked like the broken-off end of a Chinese sword-blade. It was probably a relic of the same junk that had provided the pot.

I hoped that the user had broken it only after laying out a long file of cannibals.

In a rather futile effort to raise my spirits, I began to sing the *Marseillaise,* and followed it with *Lulu* and various other bawdies. Presently the water was bubbling, and the cooks turned their attention to me. They seized me, stripped off my rag-

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ged clothes, and trussed me up adroitly, knees to chest and arms doubled at the sides, with some sort of tough vegetable fiber. Then, singing what was doubtless a cannibal chantey, they picked me up and heaved me into the pot, where I landed with a splash and settled more or less upright in a sitting position.

At least, I had thought they would knock me on the head beforehand rather than boil me like a live lobster.

In my natural fright and confusion it took me some moments to realize that the water, which had seemed scalding hot, was in reality no warmer to the epidermis than my usual morning tub. In fact it was quite agreeable. Judging by the violence with which it bubbled beneath my chin, it was not likely to grow much hotter.

This anomaly of sensation puzzled me mightily. By all rights I should be suffering agonies. Then, like a flash of lightning, I remembered the passing sidelong flick of Medusa's left eye and the apparent lack of effect at the time. Her glance had in no way *petrified* me—but in some strange fashion it must have *toughened* my skin, which was now impervious to the normal effects of heat; and perhaps also to other phenomena. Perhaps, to cause the mythic petrification, it was necessary to sustain the regard of *both* the Gorgon's eyes.

These things are mysteries. Anyway, it was as if I had been given a flexible asbestos hide. But, curiously enough, my keenness of touch was unimpaired.

Through the veering smoke I saw that the cooks were coming back, laden with baskets of vegetables. They were all getting drunker; and the chief was the drunkest. He lurched about, waving his war-club, while the others emptied their baskets into the kettle. Only then did they perceive that things had not proceeded according to culinary rules. Their eyes grew rounder and they yelled with surprise to see me grinning at them from the steaming ebullient contents. One of the cooks made a pass at my throat with a stone knife —and the knife broke in the middle. Then the chief stepped forward, shouting ferociously, and hoisted his toothed war-club.

I ducked under and to one side. The club descended, making a huge splash—and missed me. Judging from their outcries, some of the cooks must have been scalded by the flying water. The chief fared worse. Over-balanced by that mighty stroke, he lurched against the pot, which careened heavily, spilling much of the contents. Using my weight repeatedly against the side, I managed to overthrow the vessel, and rolled out in a torrent of water, smoke, and vegetables.

The chief, yowling from what must have been third-degree burns, was trying to extricate himself from the brands and embers into which he had fallen. Limping, he got to his feet after several vain attempts and staggered away. The other cooks,

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and the expectant feasters, had already decamped. I had the field to myself.

Looking around, I noticed the broken-off sword which had been used in striking fire, and levered myself in its direction. Holding it clumsily, I contrived to work my wrist-fetters against the edge. The blade was still fairly sharp and I soon had my hands free. After that it was no trick to untruss my legs.

The wine had worn off but there were many unemptied pots of it still around. I collected two or three, and put some of the spilled vegetables to roast amid the glowing coals. Then, waiting comfortably for the cannibals' return, I began to laugh.

I was washing down a well-baked taro root with the second pot of wine when the first of them crawled out of the woods and fell prostrate before me. I learned afterwards that they were deprecating my anger and were very sorry they had not recognized me as a god.

They have christened me in their own tongue *The-One-who-cannot-be-cooked.*

I wish that Pegasus would return.

SHADES OF THE THIRTIES!

A new weapon for outer space warfare—a "death ray" that would be used above the atmosphere and which might provide a possible defence against enemy missiles and satellites—seems to be in the making. The ray would be a high-velocity beam of electrons or ions, or a neutral mixture of the two, which could be directed over distances of a few miles or more. The ray would have sufficient energy to burn a hole in its target.

Laboratory tests have demonstrated that ion jets can burn holes through the heavy thickness of concrete and zirconium oxide, the latter a material that can withstand temperatures of over 5,000 degrees Fahrenheit, more than most materials and presumably more than any material which may be used in a space vehicle.

While up to now these jets have been directed over distances of only a few inches, there is no limit, theoretically, to the distance they might be "shot" outside the atmosphere, excepting the limit resulting from any instability occurring in the jet.

There are already many ways of producing high-velocity beams of particles. Some of these ways are in use in the high energy accelerators developed for nuclear research. In these machines, electrons can be speeded up so fast that they can pass easily through inches of solid material.

An eventual development appears to be this ray—making the predictions of military men in these days, and science fiction writers in the thirties, come true—that the next war may be fought in outer space.

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shadow of the sword

by . . . Wynne N. Whiteford

The problem was to get to Triton before the Alliance ship. Failure to do so could mean the end of his world . . .

THE blood thundered in Scott's ears as the speed of the centrifuge built steadily up. The light took on a reddish tinge as he deliberately pushed the spring-loaded lever further along the slot.

It took all his strength to inflate his lungs, to lift his chest against the crushing weight of the artificial gravity induced by the spin. When he breathed out, the air rasped from his throat in a fierce gust—and then the fight to inhale began again.

With the dial of the accelerometer blurred out of focus, he pushed the lever further, and again further, until the gravity forced him down into a hell of roaring darkness. . . .

"All right?" asked Hart as they lifted him out of the centrifuge.

Scott grunted. He wanted to say: "How much did I take?" But right now the effort of speech was too great.

"You did fine. Fine!" Hart's voice was exultant. He turned away. "Bring the car here," he shouted. He took Scott by the arm. "Sorry to hurry you like this, but the Chief wants you at the H.Q. right away. Some emergency came up."

Australian SF writer Wynne N. Whiteford, who has just left for Europe after a year in this country, claims the only excitement in his life has been in road testing of fast cars. Whiteford, who has a commercial law and practical engineering background, is former editor of the Australian Motor Manual. He has become well known here for his work in SF and as a writer on auto subjects.

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Scott nodded, still breathing heavily as they helped him into the car, his heart thumping solidly. Hart sat beside him in the rear seat, and an armed Security guard rode beside the driver. All the way to Strategic Command Headquarters the four of them remained silent.

When they arrived, Scott's heart and lungs were functioning almost normally. An elevator took them far underground, and then Captain Hart led Scott through a network of brightly-lit corridors to a massive door. Beside it stood two Security guards.

Hart gave a brief command, and the door slid open. They went through into a large, austerely furnished room.

"Captain Scott, Sir," announced Hart.

A heavy, bronzed man with iron-gray hair and metallic eyes looked up from behind a wide desk. Scott recognized him as General Risdon, Chief of Strategic Command.

"Sit down, Scott." The General indicated a chair in front of his desk, and dismissed Hart with a brief nod. "Just received the results of your G-test. Very satisfactory. Liked to have given you more time to recover. Couldn't, unfortunately. Matter of top priority emergency."

Scott nodded. He wished his temples were not still throbbing from the effects of the centrifuge.

"Briefly," said Risdon, "the project calls for a long voyage in the minimum possible time. That means a building-up of velocity with the highest possible acceleration — and your ability to withstand acceleration effects was one of the factors that led to your selection. The other was your knowledge of electronics."

"A long voyage," said Scott. "Might I ask where?"

Risdon looked at him fixedly for a few seconds before replying. "Triton."

"Triton?" Scott sat more erect. "The larger satellite of Neptune? Isn't the second expedition just back?"

"Right. This journey of yours won't be a normal expedition. Extreme emergency."

"Could you give me a few details?"

"First, are you willing to make the voyage? There will be only two of you aboard the ship, and the other man is not a member of the Service. But he's an experienced spaceman. You'll meet him in a few minutes—I'm having him brought here."

"O.K., if you're satisfied with him. I can get along with anyone."

"Good." Risdon took a cigar from a box on his desk and lit it before continuing. "No need to bring you up to date on the international situation, of course. Deteriorating week by week. The Alliance is matching us fairly evenly in equipment and production—in fact, it's no secret they may have a slight edge in electronic control techniques at the moment. There has been some criticism of the money spent on our explorative expeditions over the past year, you know."

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"I thought all exploration was cancelled."

"Right. We came in for a lot of criticism when Willmore took the second expedition to Triton a week after the first got back. We couldn't give a reason, what's more. But I can give you part of that reason now. You'll find out for yourself when you reach Triton, anyway."

"Mineral deposits?" suggested Scott.

Risdon shook his head. "Buildings." He looked squarely at Scott, watching the effect of the word sink in.

"You mean the Eastern Alliance beat us to it?"

Again Risdon shook his head. "These buildings were not put there by the Alliance. Or by any—" He broke off at the sound of a buzzer, touching a switch on the intercom on his desk. He listened for a moment. "Straight in," he said, releasing the switch.

"Your crew-mate is on his way in. Here in a couple of minutes. By the way, he's from Jupiter Development. For this run we're using the new ship we just finished building for them."

"Why not one of our cruisers?"

"We need the utmost acceleration. This J4 has a tremendously powerful blast—has to, to be able to bring any sort of payload up from the gravity-field of Jupiter. And every hour may count in the time between takeoff from Earth and arrival on Triton."

"Why the urgency?"

"The second expedition was investigating the buildings found on Triton by the first. Willmore took Professor Harlow out with him. Heard of him? Archaeologist. Probably top man in his field. Did all the work on the ruins around Lacus Solis."

"I've heard of him, yes."

"He stayed on Triton. Found something he considered of military value. Radioed in code. The Alliance picked up the message, apparently cracked the code in a day or two. They had a ship out beyond Jupiter's orbit, by the damndest luck—and they've ordered it to Triton. We could only beat it by using J4. This fellow who'll be flying with you is one of the Jovians who came to collect it. John Galt. Son of one of the original families who settled the Red Area on Jupiter. Born there. Grew up under 2½G all the time. Fantastic ability to stand acceleration." Risdon glanced up as a light glowed over the door. "This should be him now."

He pressed a button, and the door opened. Three men filed in. The first and third wore the dark blue uniform of the Security Guard, but it was the second man who immediately caught Scott's attention. It was the first time he had seen a man who had grown up under the weird gravitational conditions of the pressure-dome colonies on Jupiter. He was short, stocky, immensely powerful, moving with a vigorous, bounding energy. His voice boomed through the room the moment he entered.

"What are they doing to our

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ship?" He planted himself in front of Risdon's desk, bulldog jaw thrust forward, eyes blazing.

Risdon waved calmly to Scott. "Meet Captain Rick Scott. Scott, this is John Galt, of Jupiter Development."

Galt took no more notice of Scott than of the walls. He slammed a massive hand on the desk. "I ask a question, I expect an answer, damn you! What about our ship?"

Risdon tapped the ash from his cigar. "An emergency has come up. We've had to commandeer the J4 for —"

"Commandeer!" Galt's voice was a clap of thunder. "Are you trying to tell me there's a war?"

"Not yet," said Risdon coldly. "But a serious emergency has arisen. I suggest you listen to what I have to say."

Galt hesitated; he ran his fingers through his startlingly red hair. "It had better be good."

Risdon told him very much the story he had told Scott. As he spoke, Scott looked sidelong at Galt. He was wearing a gray leatheroid tunic that stretched tightly over a massive, chunky body, revealing arms of superhuman power — they looked short because of their immense thickness of muscle. His movements were tense, lightning-fast, his whole attitude a threat of explosive violence.

Scott had worked in space with many men, men of diverse temperaments. But he could think of none he would like less than Galt as a partner on a voyage almost to the outer rim of the Solar System. He began to like the project less and less.

"The ship has not been radically altered," Risdon was concluding. "Extra fuel containers in the cargo space—that's all. We want you to fly it with Captain Scott to Triton and back. That's all."

Galt flung his arms wide in a sudden gesture of volcanic fury. "The ship's paid for! If I take it up, I take it to Jupiter! Nowhere else!"

"Is that your final decision?" Risdon's eyes were like ice.

"*Yes!*" The word crashed through the room.

Risdon ground his cigar into the ashtray. "I'm sorry, Galt. I'll have to place you under temporary arrest."

The two guards moved forward. Galt seized the nearer of the two, flung him the length of the room. He spun to face the second guard with a movement so swift that Scott had the impression of watching a cut film, in which a figure seemed to move instantaneously from one position to another. But the second guard had time to draw a gun. Galt looked at it levelly for a few seconds, then shrugged his vast shoulders.

"O.K.," he said. "But this doesn't finish here."

Two other guards entered at Risdon's signal. He indicated Galt. "Take him away," he said quietly.

They went out, Galt silent, smouldering. Scott and Risdon walked across and lifted the stunned guard to his feet. The room seemed suddenly quiet.

"What happened?" The guard

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rubbed the back of his head. "Remember the guy picking me up. That's about all."

Risdon called a man from the door." Take him down to the M.O.," he said.

When he was alone with Scott, he shook his head. "These Jovian types are tough. Could use a few as commandos, if they weren't so damned unpredictable." He looked at his watch. "Might have to rely on you and one of our other boys making the flight on your own. We'll try this fellow's partner, but he'll probably have the same attitude. Haven't met him yet. We only dealt with Galt. Let's get down to the launching pit. The sooner you look at the J4 the better."

They traveled to the shipyard in Risdon's private air-car. The J4 was standing in a great circular launching pit, bathed in cold indirect light. The sliding roof of the pit shut off the view of the night sky.

Scott was amazed at the bore of the quadruple blast-tubes jutting from the J4's short, thick hull. Somehow the ship reminded him of Galt, with its thick compactness, its obvious potential fury.

He went aboard with Dean, the engineer in charge of the modifications. He pointed out the massive fuel containers built into the former cargo-hold, then led the way up the ladder to the control-room.

"Not much space for two men," explained Dean. "These ships are only meant for the run between the Red Area on Jupiter and Ganymede. Not a long haul. There's space for one man to sleep, behind the control-room. You might have to bend your knees up, but it's all we can do."

The left set of controls had been changed from Jovian to standard specifications. "How long to switch over the other controls?" asked Risdon when Dean and Scott rejoined him on the ground.

"Couple of hours," said Dean.

"Get all the parts you need on hand. We may have to do it."

Scott looked up at the ship. Its towering outline was vindictive, ominous.

"Terrific thrust, these motors," said Dean. "D'you know, these ships operate on 16 and 18G when they're climbing out of Jupiter's gravity-field. They tell me—"

All three of them turned at the sound of a commotion near the elevator. A short, energetic girl in a blue cloak came quickly forward, the light gleaming on her red-gold hair. One of the Security men barred her way. She looked up at him angrily, stamping her foot to emphasize something she said to him. He shook his head. Suddenly she put her hand on his chest and shoved him aside. He reeled back half a dozen paces, and the girl stormed across towards Risdon and Scott.

"What have you done with my brother?" she demanded in a surprisingly resonant voice. She stood looking up at Risdon, the top of her head level with his chest, her eyes flashing. "I'm Brenda Galt.

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We've paid for this ship, and we're flying it home."

Risdon looked stonily down at her flushed, upturned face. "Miss Galt, your brother attacked one of my men. We've been forced to detain him. As to the ship, we've been compelled to commandeer it."

"What?" Her voice echoed from the cement walls of the pit.

Risdon outlined what had happened.

The girl listened, her anger abating somewhat, although her mouth remained set in a firm line. Scott decided to risk Risdon's disapproval and take a hand in the conversation.

"We realize it inconveniences your people for a while. But we'd appreciate it if you'd help us."

With the same tense swiftness of movement as her brother, the girl pivoted on her high platform shoes to look at Scott for the first time. "Well," she said. "If it's as vital as you say . . . Who else would be aboard?"

"I would."

Her eyes swept over him. "The takeoff will probably kill you. Do you mind?"

"Yes. But the General has promised me a splendid funeral."

Unexpectedly she laughed — a deep, rich, vibrant laugh with no restraint in it. "I like that." She turned back to Risdon. "If I do this for you, what happens to John?"

"He'll be released when you return. Of course, you must realize he has committed an offence. We can't ignore that." He managed to smile. "Not completely."

"When will the ship be ready to travel?"

"Dawn tomorrow."

The girl nodded. "All right. I'll do it." She turned to Scott. "I didn't get your name."

"Captain Scott. Otherwise Rick."

"You can call me Bren." Scott held out his hand, and she gripped it with astonishing quickness and strength. "See you here in the morning," she said.

She spun round and strode rapidly towards the elevator, the high heels of her platform shoes clicking hard on the concrete.

"Well," said Risdon, "there's your crew. Believe they've only ten pilots in Jupiter Development. I'd heard three of them were women; but I didn't believe it. Don't let that smile get you off guard. When we started the Jupiter colony, we didn't realize we were starting a different kind of human being. Dangerous to work with. Necessary right now, but dangerous. Like a fusion bomb."

The morning was clear and fresh. The sliding roof had been rolled back from the launching pit, and the sharp nose of the ship pointed towards the lightening sky. Scott was already in the heavy space-suit he would wear for the takeoff, the tough plastic bubble helmet under his arm.

He heard quick, firm steps on the cement behind him, and turned as Bren Galt joined him. The close-fitting space-suit made her body look

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compact, dynamic. The expression in her eyes was unreadable.

"Ready?" asked Scott.

"Any time."

Within minutes, they were strapped in the twin control-seats, the narrow chart-table between them.

"Since you're used to high-gravity acceleration, you take her during the initial lift. O.K.?"

"Right. Can you stand 16G's?"

"Don't know. Never been tested that high in the centrifuge. Might black out."

"Doesn't matter. I've taken that in every lift we've made from Jupiter's surface. Just relax."

Waiting for the count-down, Scott found he was sweating. He glanced across at the short, unbelievably strong figure beside him. In profile the girl's face looked surprisingly young, with its short, upturned nose. He watched her gloved hands checking the feel of the controls. The right hand was quick and supple. The left one was curiously rigid at the wrist, its fingers and thumb stiffly curved. It kept the same immobility as she used it to push and pull the lever of the blast-regulator.

"What happened to your hand?" he asked.

She looked at him quickly. "Heating wires in a suit burned out. Frostbite. Happens easily on Jupiter." She lifted it. "This is plastic. Works all right, though. Don't worry."

He hadn't time. A moment later the control officer's voice came through the radio, checking with him. Then the count-down. As the voice reached zero, Bren Galt touched the firing-button.

The ship shuddered with the ignition of the rockets, and then, in an incredibly short time, it was airborne, driving up on full blast. The acceleration flattened him in his seat, slamming him into blackness quicker than any centrifuge test or actual takeoff he had ever experienced. For minutes that were like days, he knew nothing but the screaming thunder of rockets and atmospheric friction on the hull, and then the thunder died away, leaving only the high, sustained shriek of the blast driving into the vacuum of outer space.

He heard a voice calling his name. "Rick! Rick!"

He wondered whether he had dreamed it. It came again.

"Rick! This is Bren."

"O.K." he said. He had to force the sound out through his clenched teeth.

"I'm stepping up the blast. O.K.?"

"O.K.," he answered, without absorbing the full meaning. The pressure slammed down harder on him, and the inferno of sound seemed to close in on him. Somehow he remained conscious, at least in the sense of being aware that he still existed, although he was unconscious of anything about him. How long it lasted he didn't know, but after an eternity the weight abruptly lifted. The scream of the blast died in a hollow, spluttering crash that seemed to echo through his skull.

He lay still, feeling the heavy

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pounding of his heart, feeling his ribs creak as he drew air into his lungs again in deep gulps. His head seemed to spin in a red mist.

"Are you all right?" she asked.

"Of course." Incredibly, she laughed. "You did better than I thought. Have to come to Jupiter some time."

He watched the interior of the cabin emerge from the blur, parts of it striped with white-hot sunlight, the rest in ebon shadow. He touched the button that closed the filters over the small ports. The quiet hum of the gyros, the purr of the fans sounded almost hypnotic. With an effort, he switched on the rear vision-screen, focussing the dials on the receding image of the Earth. A thin, reddish crescent of refracted sunlight flared along one side of its shadowed disc. He checked the radar-pulse, and read off the rapidly growing distance from Earth.

"Dead on course. Dead on schedule," he said.

"Naturally." Her voice showed neither surprise nor warmth.

He checked the pressure in the cabin, then switched off his helmet radio and removed the helmet, releasing the straps holding him in the control-seat. With the gyros he gave the ship a sufficiently fast axial spin to get a reading of three-tenths G on the accelerometer at three feet above the floor of the cabin—enough to enable them to walk about comfortably, and to help the normal circulation of air within the ship. The outer television cameras and radar gear were set to automatically compensate for the spin.

He climbed out of his space-suit, stretching his arms. Bren Galt watched him from the other control-seat. He was wearing his regulation shirt and shorts, and her eyes fixed on the small automatic pistol at his belt.

"Why the gun?" she asked.

"Regulations," he said without flicking an eyelash.

She curled the corner of her lip in an almost imperceptible expression of disgust, and zipped open her space-suit, getting out of it quickly although she had to manage it one-handed. She shook her head almost angrily as he reached across to help her, and he returned to his checking of the instruments.

This, he thought, was going to be the most unpleasant journey of his career. Last night, he had thought of the idea of a sixty-day journey with a woman as a vaguely exciting contrast to the normal routine of a two-man flight. But now?

He watched her fold her space-suit and stow it in her locker. She was wearing a green leatheroid tunic that left her limbs bare. Her short, strong body was fantastically swift in its movements, with the effortless swiftness of a powerful animal, intensely specialized to the crushing gravitational field in which she had grown up. Her right arm was stronger than an Earth-born man's, its hand moving with the lightning precision of a striking snake. The left arm was mostly of smooth, flesh-colored plastic, specialized so that

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she could push and pull the blast-regulator levers of a ship by movements of her shoulder, but useful for little else.

Scott took a sighting on the Earth, and another on Jupiter, thirty degrees off their course to the left. Mars, Saturn and Uranus were scattered round their orbits on the far side of the Sun, so that the way out to Neptune's orbit would be empty apart from asteroids and meteoric matter. He marked their position on the three-dimensional charts.

"Would you check the course?" he asked.

With an unnaturally quick, bounding movement, she was at his side. She focussed the points of reference efficiently on the cross-lines of the screen, her hand flashing from one positioning dial to the other. She transferred the co-ordinates directly to the slide-rule, working it skillfully between her fingers, then spinning round to check his markings of the charts.

"That's all right," she said, slipping the rule back into its case.

They agreed to split their watches at the controls into alternating periods of five hours. She was used to a ten-hour day on the Red Area of Jupiter, in which she was active for a little over six hours, asleep for a little under four. Whichever was off duty slept in the cramped bunk in the computer-room behind the control-cabin.

In most flights Scott had made on two-man ships, the first few watches were crammed with conversation, especially when the team had not been together in space before. Here, though, there was little communication between them. Most of the time one was in the cabin, the other in the computer-room.

As Scott was an hour off the end of his fifth watch, he heard her moving about in the computer-room, and in a few minutes she came through into the cabin.

"Couldn't sleep," she said. "Think I'll heat some coffee."

"Heat another bulb for me," he said.

"All right." She got a second bulb of coffee from the storage compartment and took it to the filament heater. Putting the bulbs in place, she switched on, turning with her usual flashing movement to look at Scott.

"Aren't you tired of carrying that gun?"

"Regulations."

She crossed to the chart-table alongside his seat and looked into his face. "What are you afraid of? Me?"

He stared coldly back into her steady eyes. "Part of our training is to stick to regulations. That's all."

She stayed there a few seconds, then flung herself away from the table and back to the heater, her back towards him. The whole movement had a more-than-human speed and power in it, the effortless action of immensely powerful muscles working well within their capacity. He looked at her short, broad back, with the swelling curves of smooth

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muscle under the green leatheroid tunic, the red-gold head proudly erect above the strong shoulders. Surreptitiously, he checked for the tenth time that his gun was free in its holster.

She switched off the heater and crossed to the table, holding out the coffee bulbs between her fingers. He took one, and they both drank in silence. He noticed her small, firm breasts under the smooth leatheroid, oddly out of harmony with the superhumanly powerful arm. She took his coffee bulb when he had finished it, put both into the disposal chute, then vaulted up onto the edge of the chart table, sitting close alongside him.

"Mind if we talk for a while?"

"Why not?"

She looked down at the chart. "Where's Jupiter right now?"

"Over here." He switched the telescopic viewing-screen to full magnification, and spun the dials until the small, bright disc of the giant planet came into the field, flanked by four bright starlike points of its major satellites and a ragged line of fainter specks.

She looked at it for a moment. "You can just see Amalthea off the bright side," she said. "You get a terrific view from there. Jupiter's a huge globe nearly filling the sky."

Scott decided to keep the conversation flowing. "What's it like down on the Red Spot?"

"Red Area! Not Spot! There's over a hundred and fifty million square miles of it—three times all the land area on your Earth."

"All solid hydrogen?"

"Not all. But that's the base of it—an iceberg of solidified gases, thirty-thousand miles long, floating in an atmosphere that's compressed down below it to a higher density than any of your Earth liquids. Of course, conditions are quite different, there. Ice is like permanent rock, hard as iron. Some of your liquids are like metals there."

While talking, she had taken a pencil from its clip and was figuring on a scratch pad.

"You live in sealed buildings all the time?"

"No. We go about in pressure-suits and pressurized vehicles a lot." He tried to see what she had been calculating, but she tore the sheet from the pad and crumpled it.

On the hour, Scott turned over the watch to her, and went into the computer-room. It was a long time before he fell asleep, and then he awakened at once when he heard her moving about the cabin. She was quiet after a while, and he slept.

When he went into the cabin for the next watch, she was sitting in the control seat where he had last seen her.

"Everything O.K.?" he asked.

"Yes. Except that something sputtered up forward. Sounded as if something fused. I couldn't find anything wrong."

He went forward and looked behind the panels at the maze of wires. He tested the instruments one by one.

"Somewhere in the wiring of the meteor-detector," he said. "I'll rig

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up a bridge and find where the short is."

"I thought of doing that," she said. "But I decided to let you do it." With a movement of her shoulder she bent the plastic arm. "I can fix most things, but not wiring."

He had to get behind the panels to locate the fault. She passed him in the tools he needed, while he squirmed into a more comfortable position in the cramped space.

"That should hold it," he said at last. "Now to get out of here."

He froze as a deep, steady hum grew in volume in the rear of the ship. Fuel pumps. Frantically he slid back through the narrow space between the panels and the bulkhead. When he emerged he saw Bren Galt sitting at the controls, her face pale and set.

"What —" he shouted, but without waiting for the pumps to build full pressure she slammed the regulator lever right forward.

The ship leaped as though under the impact of a vast hammer. Scott spun the length of the cabin and cannoned into the rear wall. . . .

The impact must have stunned him. How long he was unconscious he didn't know, but when he opened his eyes the ship was silent again. He was lying on the floor, with the short, vigorous figure of the girl bending over him. As soon as he blinked, something hit him hard under the angle of the jaw, and for a while he was aware only of spinning blackness.

When he awoke, his head throbbed heavily. He tried to move, but tight bands held him motionless. Looking down, he found that he was sitting in one of the control-seats—tied there. Tied by yards of heavy insulated cable, bound round his wrists, his ankles, his entire body. He had barely grasped the situation when the pressure of acceleration came on, blacking him out almost at once with a thunderous roar of rockets.

He must have stayed unconscious long after the blast ceased. When he was finally able to turn his head, he looked across at the other seat. His eyes met Bren's.

"We've altered course," she told him.

He said nothing. She looked at him as though she expected comment. "This is our ship," she said at length. "Designed and built to our specifications, paid for by us. By Jupiter Development. We have to have it. We only have three ships, and the cargo space of the three together doesn't equal this one's. Your Strategic Command can't get it into their thick heads that our set-up can't exist without trade. *We've got to have this ship*—do you understand? It took all our resources to buy it."

"You should have thought twice. There's a war about to break."

"War? We're not interested in Earth politics."

He let her rage on for minute after minute. When she had talked

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herself out, he looked across at her again.

"Remember one thing. Security is still holding your brother."

"Let them. I've no time for him. He's my half-brother, anyway. There are only a few families down home. I only worked with him because it was the only chance to get into space." She lifted the plastic arm. "I used to be a better pilot than he was, before this. And this was his fault, too. Lent me a suit with faulty heating-wires in the sleeve. I was never quite sure whether he did it on purpose—we were both in the running for Chief Pilot of the J3, and I think I would have got it. I had to walk home a mile over solid hydrogen at near absolute zero with frostbite. But he didn't care."

Scott was silent for a while. "Are you going to leave me tied up all the way down?"

"Nothing else I can do, is there?" Suddenly she got out of the seat and moved across, standing in front of him. He noticed that she had his automatic pistol strapped at her hip. "Sorry about this. I've got nothing against you personally."

"Forget it," he said sarcastically.

"I think you'll be all right on the Red Area. The first settlers were Earth-born, and they managed to adapt to 2½G."

"Thanks."

She sat at the controls for a straight six hours, then switched the radar onto audio-alarm. She brought the bunk from the computer-room and set it up in the small clear space in the middle of the cabin, lashing it to the chart-table supports and the instrument panels with lengths of the same type of insulated cable as she had used to bind Scott. He watched her tie the ends with her single hand, his eyes narrowed. She relied on twisting the cables together, letting the stiffness of the twisted lengths hold them in place. This could be the only way she had tied him. A steady pressure might just possibly suffice to untwist the ends.

Her movements had lost some of their vigor, and her eyes were darkly shadowed. He remembered that she lived by a ten-hour day, and decided that Jovian-born people might have evolved a different rate of metabolism. At any rate, she looked more fatigued than he had seen her look before.

She went in the computer-room for a few minutes, and returned wearing a loose plastic-foam wrap, walking bare-footed, and carrying the plastic arm by the straps that normally secured it to her body. She took Scott's automatic from the pocket of her wrap, put it beside the bunk within easy reach, and lay down. She looked at him with insolent, half-closed eyes for a while, then suddenly was asleep.

He watched the steady rise and fall of her deep chest for a time, then began putting as much pressure as he could on his bonds. He had been right. They yielded slightly.

He kept working at them, sweating. After half an hour, the cables

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were quite loose. In three-quarters of an hour, he had his hands free. Watching the sleeping figure closely, he freed his legs and body, stretching his limbs slightly to get the circulation back to normal.

Bren rolled over in her sleep, her hand on the opposite side of the bunk from the gun. Scott rose to his feet and moved slowly across.

In a flash she was awake, her hand on the gun even as he dived for it. He got one hand on the barrel of the gun, the other on her wrist, putting all his strength into forcing the gun around to bend her wrist inward. She screamed in sheer fury, throwing him off balance with a violent roll of her body, but he kept up his pressure on her wrist. A second later he was standing back, the automatic in his hand.

"Get up," he said curtly.

She sprang to her feet, looking down at her wrist and flexing her hand.

"Into the seat," he said. "And strap yourself in."

She climbed into the right control-seat, fastening the straps about her. He made her put her arm behind the seat, pulled the sleeve of the plasti-foam wrap down over her wrist, and bound her forearm to the support of the seat with a length of the same insulated cable she had used to bind him. He made sure he knotted it so that she couldn't free herself.

"We're altering course again," he told her.

"You haven't enough fuel left."

"We've enough to make a landing on Triton, and still use enough speed to get there on time. We can always make a slow trip back. But by the time I've changed course again, we won't have enough to get down on Jupiter without a crack-up. Remember that."

Sullenly, she struggled to free her arm, lips compressed in a tight line. He plotted a fresh course, checking his sightings and calculations carefully. By the time he had finished she had given up struggling and was sitting with tears glistening in her eyes. She turned her face away from his as she saw him looking at her.

Scott shrugged, swung the ship with the gyros, and blasted at 10G for the calculated time. He might have built more speed by taking it higher, but he couldn't risk a black-out at this stage.

With the blast finished, he checked his course again. They would probably lose twenty hours by the changes of direction in the total journey, but little more.

"What are you going to do with me?" demanded Bren.

"Haven't decided, yet," he said calmly.

He obviously couldn't leave her tied there for the entire two-thousand million miles between here and Triton. Yet she had run away with the ship once, and she was probably quite capable of killing him. He had to sleep some of the time.

He picked up the plastic arm from near the bunk. "You might as well give me that back," she said. "There's no point in my giving you any more

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trouble. We can't make a Jupiter landing now."

Without answering, he stowed the arm in his locker, locking it in and putting the key in his pocket. She gave no sign of anger beyond a slight narrowing and brightening of her eyes.

He checked the fuel supply carefully, and figured the amount needed for a landing on Jupiter. When he was certain it was impossible, he showed her the figures, dropping the pad in her lap.

He lit a cigarette as she studied the calculations. "I don't have to ask you to promise to co-operate," he said. "I just want you to see there's nothing else you can do. I could leave you tied there."

"I've told you there's no point in my giving you further trouble." Her voice was unexpectedly quiet. "If you wouldn't mind . . ." She indicated her bound arm with her head.

Scott released the cables binding her arm. She flexed it carefully, wincing slightly. "Thank you," she said in the same subdued voice.

He kept the radar switched on audio-alarm. They were well past the main asteroid belt now, with only the orbits of the relatively scarce beyond-Jupiter asteroids ahead of them, and odd meteoric debris.

They settled into a routine again, Scott always watchful. He slept in the computer room, the gun always close to hand, and an alarm improvised secretly inside the doorway. They spoke little, except for routine questions and answers about course and calculations.

A hundred hours beyond Jupiter's orbit, the long-range radar suddenly went out of action, the bright swinging line of light motionless across the screen.

"Scanner's stopped spinning," said Scott.

"But why?" Bren moved alongside him.

"Probably a fleck of meteoric dust hitting the bearings or the spindle, or even the motor housing. A thing smaller than a pin's head would be enough. Impact woudl vaporize it, and the heat would do the rest."

"What happens now?"

"Normally, I'd go out on the hull in magnetic boots and free it."

"Normally?" She frowned. "I see. You think once you're outside I'd give the rockets a flick, and leave you adrift. Is that it?"

"That's exactly it. We'll run without it."

She shook her head. "I couldn't do that."

He looked at her fixedly. "There's too much to lose. It's not me. It might make all the difference to the survival of the Federation."

"Aren't you taking a bigger risk in running without radar?"

"I don't think so."

She turned her back and went out of the cabin. Scott looked at the useless radar screen, then switched it off. He felt uncertain. The outer belts of the Solar System were still only sketchily charted. There were still occasional meteor swarms, iso-

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lated lumps of rock, even straggling asteroids out this far.

He began to make an attempt to figure the statistical chances of a collision with an object large enough to do major damage to the ship, but his data was insufficient for a conclusive result.

After some minutes, something black and glossy caught the edge of his vision in the doorway. It was Bren in her space-suit, her bubble helmet under her arm.

"Better help me on with this helmet," she said. "Then let me out the airlock. I think I can trust you not to blast away from under me, can't I?"

He went over to her; her face was pale, her lips set.

"Have you ever worked outside a ship in free fall?" he asked.

"Yes. On a run down from Ganymede."

He wondered whether it was an act. He took the helmet and locked it on, connecting her suit-radio through to the ship. He got a kit of tools and harnessed them to her. Without speaking, she walked into the airlock as he opened the inner door. Her face was white but still resolute as he closed the door.

"All right?" he asked through the radio.

"O.K.," her voice came back to him.

He waited a minute, then got into his own space-suit and fitted the helmet into place. With the gyros, he killed the axial spin of the ship, and in zero gravity moved towards the airlock again.

Maybe he was taking an unreasonable chance. Trusting his judgment beyond wisdom. He opened the airlock door again.

"What's wrong?" she demanded.

"Come inside. I'm going out."

She hesitated, then moved out of the lock. "I could do it."

"I'll do it. If anything goes wrong out there, carry on to Triton and contact Professor Harlow from orbit. The waveband and call-sign are on the pad on the chart-table. He'll tell you what to do."

He eased into the lock. "By the way," he said. "The key of my locker is on the table, too."

She closed the inner door, and he watched the red light come on as the pressure dropped.

"Suit holding pressure?" she called through the radio.

"O.K."

The outer door opened. Scott climbed cautiously out onto the steel shell of the outer hull, his magnetic boots clanking on the smooth surface. The vastness, the emptiness were breathtaking, with the coldly brilliant shower of the Milky Way slanting off to a seemingly infinite distance like a waterfall without beginning or end. The Sun was far off, a shrunken, white-hot ball against the greenish spear-points of the corona.

He moved slowly towards the pointed nose of the ship, spiralling round out of sight of the airlock until the radar scanner came into

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view. He found the trouble soon enough—a fused streak of metal jamming a bearing, where some minute fragment of matter had struck head-on at a combined velocity of five-hundred miles a second. He removed the bearing housing and filed the droplets of re-solidified metal away. The job of re-assembling the housing in thick electrically heated gloves was difficult and tedious.

"Try it," he said at last into the radio.

The scanner began its regular spin, throwing its parabolic beam round and round with a complex weaving motion to take in a three-dimensional sweep of surrounding space.

"Rick!"

"What is it?"

"Screen's picking something up. Ahead."

He felt suddenly cold, glancing involuntarily ahead into the nothingness between him and the unwinking stars. "How far?"

"Almost extreme range. Better come in fast."

"Coming now." He moved back towards the airlock. The outer door was open, and he felt a sudden trembling as he eased between the steel walls, pressing the button. The outer door closed, and he waited for the green light to show equalization of air-pressure. When the inner door opened, he moved quickly into the bright interior of the ship, stripping off his suit and moving forward into the cabin.

Weight gradually returned as he began the axial spin again. Bren was standing at the radar screen, and he crossed to her side.

The range of the screen was three astronomical units, and the faint blip was almost touching the edge of the screen. "Shouldn't we be closing on it quicker than this?" asked Bren.

"Should. This thing's moving the same way as us."

"A ship?"

"The Alliance ship. Couldn't be anything else." He took his slide-rule and made a series of rapid shifts with it, jotting on a pad. "On this course, we'd pass within a tenth of this distance of it."

"How far does their radar reach?"

"Don't know." He turned to the chart-table, looking at the long, slightly curved line of their present path intersecting the similar line of Neptune's orbit. "We could use the rest of our reserve fuel to diverge. That would bring us to our mark at an earlier point on its orbit. Keep us further away from the other ship. Wouldn't leave us much in hand on landing, that's all."

Bren put her hand in her pocket. "By the way, you left your gun behind when you went outside. Do you want it?" She took it from her pocket and held it out to him, balancing it on her palm.

He stood for a long time looking at her. Then, with a sudden easing of tension, he laughed. For the first time on the voyage, they laughed together. He took the gun, picked up the key of the locker from the table, unlocked it and tossed the gun inside. He took out the plastic

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arm and held it out to her. "You may as well have this back."

"Thanks." She hung it near her seat.

He made rapid calculations, and fed data into the computers. Then he positioned the ship carefully with the gyros and delivered the short, accurately measured blast to deflect them on to their new line of intersection with Triton's orbit.

"When we get there," he said, "We've got to make a perfect approach run—the first time. We can't spare fuel for a second try, or we'll never get off again."

"We'll make it," she said confidently.

"It's going to need a very high intensity blast for deceleration. Will you handle that?"

"Don't worry. You've got one of the best high-acceleration pilots you could get." She smiled. "You know, I think we make a good team."

"Best the Federation could find," he said. He extended his hand, and she shook it gravely.

"I like you a lot better without the gun," she said irrelevently.

The radar blip of the other ship slanted away at an angle across the screen as they gradually overhauled it, passing it on the side away from the ecliptic. Through the long hours in which it fell gradually astern out of their range, Scott checked its position at regular intervals to watch for any acceleration or change of course. But he could detect nothing.

"Think they picked up our blip?" asked Bren as they were almost beyond range.

"No sign of it. But that might be deliberate."

In the forward screen, Neptune was still only a bright greenish star against a backdrop of other stars dusting the immense darkness beyond.

They settled into a routine again, but this time without tension. Watch followed watch with the distant greenish spot of light showing no perceptible growth on the screen, though the temperature of the ship dropped steadily as they travelled further from the Sun.

To conserve power used in heating the cabin, Scott decided that they would use heated clothing for the remainder of the voyage out. He changed into his regulation suit of skin-tight black plastic, adjusting the temperature of the fine mesh of insulated filaments within its fabric. Bren put on her own more colorful garments in the computer-room, and returned in a pair of boots-cum-trousers and a hooded coat of blue synthetic fur. As she entered the cabin in this outfit Scott started slightly.

"What's the matter?" she asked. "Forgotten I was a woman?" She crossed over to him. "Could you plug in this glove?"

He took the supple crimson plastic glove and held it so that she could thrust her hand into it, feeling the strong movement of her fingers. She stood quietly as he plugged the heating wires into the sleeve.

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"You know," she said, "you're the only man who's ever been able to handle me, apart from a Jovian. If anyone had told me an Earthman could take a gun out of my hand I wouldn't have believed it."

"Science can count more than strength," he said.

"Maybe. Science—or will-power. You know, you're quite a guy."

"Thanks," he said non-committally. He picked up the slide-rule, made a few quick shifts with it, and marked a few points on his charts. She watched the rapid, effective movement of his hands.

"You married?" she asked suddenly.

"No."

"Someone waiting for you back home?"

"No-one."

"I see."

He looked after her as she moved across the cabin and began focussing the vision-screen. The hooded coat of blue fur and the crimson glove added a feminine touch that somehow didn't look as out of place as he would have expected.

They ate their meal together, silent most of the time. "Do you mind telling me something?" she asked suddenly.

"Go ahead and ask."

"When the radar jammed—you didn't have to go out there yourself. Why did you stop me?"

He shrugged. "It was my job—that's all."

She looked at him steadily. "Was it because you didn't think I could do it?"

He shook his head. "It wasn't a job for a woman."

"Think I need protecting? Under Earth gravity I could lift three times my own weight with my one hand."

"You're still a woman."

She began to say something, then stopped. Her eyes looked bright and a trifle moist. Finishing her meal quickly, she went almost immediately into the computer-room. It was a little early for her sleep-period, but Scott hadn't bothered to stick to too rigid a schedule of watches between them.

He passed the next watch with occasional sightings, calculations, checking of the course. The radar picked up nothing beyond a scattered drift of meteoric matter half a million miles abeam at its nearest point. The external temperature of the hull was still gradually dropping as they travelled ever further from the Sun into the empty dark.

"They told me you were retiring from the Command after this run," she said during their next meal. "What will you do afterwards?"

"Probably a freight run. Team up with another pilot, operate a small freighter between the settled planets—if the war doesn't finish everything."

"I see." Again, he had the impression she had begun to say more, changing her mind.

Closer at hand, Neptune appeared as a blurred greenish disk crossed

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by dark and light bands. Nereid, the smaller moon, was throwing a round jet-black shadow on the disc. Triton was away to one side, already showing irregular surface markings.

They reversed the ship with the gyros, and Scott checked over the period and intensity of the deceleration blast for the final time. To gain the maximum result from his strictly rationed fuel, he would need a shorter and even fiercer blast than at takeoff. He showed the figures to Bren.

"Looks as if it's up to you," he said.

"Can you stand it?"

"Have to. We want some fuel left for the return."

"I can't use that acceleration. It would kill you. Only a Jupiter pilot could stand it."

"I can take it. Do it."

They strapped themselves into the control-seats. He made his final checkings. "All yours," he said.

The howl of the blast lifted to a frightening scream as the pressure built up. Blackness. The weight of many tons pressing down on him, the heavy thudding of his heart, the almost impossible task of getting air into his lungs—he was still aware of these things for a long time through the darkness. Then, sooner than he had expected, it was over.

He focussed throbbing eyes on the instruments. "Good work," he said. "That leaves enough fuel . . . to swing into orbit. . . . Then land. Then off again. Refuel at Earth's orbit for landing." He was speaking in slurred, jerky phrases, with a deep gulp of air between each.

He was suddenly aware of Bren leaning over him, the hood of her coat back, her red-gold hair disordered.

"Rick! Are you all right?" Her face was tense.

He grinned. "Sure."

"I was afraid—" She leaned closer, her eyes exploring his face. "I was afraid I'd killed you." Their eyes met for a moment, and she looked quickly down and began unfastening his safety-straps, pulling them free and throwing them aside with unnecessary sharpness. He caught her hand and gave it a brief, firm pressure. She answered him with a forced smile and walked away.

When they were in orbit about Triton, he broadcast the call-sign over and over. In the screen, the barren surface of the satellite unrolled under their vision-screens. More than five-thousand miles in diameter, it was more like one of the Earth-type inner planets than a satellite, but veiled with a thin methane atmosphere, with white plains of frozen ammonia and jagged mountains of ice and dark rocks of substances that might have been liquid or even gaseous under Terrestrial temperatures.

On the lighted side of the planet, a sparkling point of emerald-green light flashed briefly at intervals. Scott brought it into full magnification on the screen, but all he could see was the single intermittent pin-

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point of green fire at the foot of a ridge of mountains that gleamed in the wan sunlight along the edge of a frozen ammonia ocean.

"What's that light?" asked Bren.

Scott shook his head. "Don't know. Must be something Harlow's rigged up. Don't know why he didn't use a standard landing light, or where he got the gear for this."

"Could it be the Alliance people?"

"Have to wait till we get a reply."

A response came in a few minutes. First a crackle in the receiver, then a thinly-audible voice.

"Harlow here. I hear you clearly."

Scott grabbed the mike. "Captain Scott, Strategic Command. Can you give me co-ordinates for landing?"

"Can you see my beacon? Land on the ammonia surface a mile westward."

"O.K. Out."

Scott took the ship round in another circuit, killing the speed and dropping towards the plain of solidified ammonia, the ship tail-downward, vertical on her gyros. The view-astern screen showed the white, barren plain rushing to meet them, with a darker line of jagged peaks swinging out of the picture to one side. He switched to automatic, letting the radar and computer take over the landing.

They dropped on a screeching blast that sent vast clouds of ammonia whirling outward and upward as they neared the ground, so that as the moment of contact came close the screen showed only a flame-lit chaos of boiling fog. Then the blast cut off, and the ship was down, tilting slightly as its fins ground unevenly into the hard-packed surface.

Scott got to his feet, stamping his feet on the floor. "We made it!" he shouted exultantly. He clapped his hand on Bren's shoulder. "Thanks."

Harlow's voice blared from the speaker, surprisingly loud and deep after the thin whisper they had heard while in orbit. "Glad you made it, Scott. I'll be out there to pick you up in my runabout in a few minutes."

"Thanks," replied Scott. "Don't hurry—the ship will be hot for a while."

"O.K. Out."

Scott spun the dials of the viewing-screen, traversing the field around the bleak horizon. Westward, the flat plain of ammonia stretched like a frozen sea to a flat skyline, beneath a dark, green-tinted sky in which the brighter stars still shone through the thin methane atmosphere, despite the fact that it was mid-day. The eastern horizon was filled with a range of eroded peaks like vicious fangs, snarling clear of the snow-like covering with spires of naked rock.

Suddenly his hands seemed to freeze on the spinning dials.

"Look!"

Buildings. Buildings unlike any he had ever seen. Long, inward-sloping walls of what looked like

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green metal, broken here and there by doorways, with strange towers and domes rising above them. He followed them with the vision-screen for miles along the foot of the range. At one point a thing like a medieval campanile stabbed high into the air. Further along he found the flashing green light, on top of a high, tripod structure with a strange arrangement of metal rings surrounding it. The light flashed with a piercing emerald brilliance every three seconds or so—and then, while they were still looking at it, it suddenly shut off. Scott traversed the length of the buildings again, but this time nothing was moving.

Scott looked at Bren. Her face was suddenly white.

"I wonder," she said slowly, "if some earlier race on Earth found space-travel, and built these?"

Scott shook his head. "I don't think so. Look at the design. Every detail of the architecture, the style. It looks—alien."

A slight movement on the screen brought their attention to a small shape moving straight towards them, trailing a cloud of ammonia-snow behind it. Closer, it resolved into a compact electric runabout of the type carried in space-craft, with one man aboard.

They fitted their helmets into place, checked them for air-pressure, and went out through the airlock, climbing down the metal ladder to the frozen ground. Harlow swung the four-seater runabout alongside them, and waved them aboard. They couldn't see much of him in his space-suit, beyond realizing that he was a tall, lank man with a darkly tanned face.

Scott and Bren could communicate through their suit-radios, but they were unable to reach Professor Harlow in the same way. He waved towards the distant buildings, and drove off towards them almost at once.

In front of the long metal facade was a domed aluminum pressure-hut about twenty feet in diameter, with round windows like port-holes and an airlock at one side—one of the standard types of hut used by explorative expeditions. Harlow parked the runabout alongside it, and they crowded into the airlock. Within a minute, they were inside the dome, stripping off their space-suits.

"Good to see faces again," said Harlow, as he shook hands with Scott and bowed to Bren. "And this lady's name—"

"Miss Bren Galt," said Scott quickly. "Miss Galt is my co-pilot. She's a specialist in high-acceleration takeoff."

"Ah, of course." Professor Harlow was taller than Scott had thought, and thinner, with skin like dried leather. He might have been any age from fifty to a well-preserved seventy, with white hair and surprisingly young-looking eyes. He looked at Bren with interest. "From the Jupiter Base, I should say? Marvellous project, that. Magnificent physique you people have." He

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looked out of the windows towards the alien buildings. "Variations of the human physique are going to be needed. Have to change our ideas about the human norm." He made a wide gesture with his arms. "The Solar System isn't going to be our only home much longer. There's a whole galaxy waiting for us—a thousand million planetary systems."

"If anyone ever reaches them," said Scott.

"They will. They *have*."

"They *have*?"

Harlow gave a dry chuckle. He waved towards the buildings. "Of course. I'm going a little fast for you. As soon as you've rested, I've something to show you."

"I'm ready whenever you like," said Scott.

"All right' if I come along?" asked Bren.

Harlow looked enquiringly at Scott, who nodded. "Of course it's all right."

They climbed back into their suits. "The sooner the better," Scott told Harlow. "The Eastern Alliance picked up your broadcast. They have a ship on the way here. Should reach here in a few days."

"Then I'll take you straight to the vital part of my discovery. A pity. I wanted to give you a full tour of these buildings. Obviously a highly advanced culture."

"Equivalent to our own?"

"Hard to evaluate. So different. In my opinion they'd travelled much further—technologically, at least. Otherwise I can determine very little about them."

They walked across the ammonia-snow to the nearest of the buildings, where Harlow led them to what was obviously an airlock. It had sliding doors of some golden metal that fitted perfectly, sealing by mirror-smooth metal-to-metal jointing. As the inner door of the lock opened, they found themselves looking into a long gallery with sunlight filtering through green-tinged windows in its vaulted ceiling.

Harlow began removing his suit. They did likewise.

Harlow waved his hand upward. "The builders of this place used an oxygen-helium atmosphere. Still plenty of gas liquified in containers. First time I breathed it I was nearly too drunk on oxygen in five minutes to find my way out. I managed to alter the proportions coming through the valves."

He led them along the gallery. Gravity on Triton was not much more than half Earth-normal, and Scott found himself moving easily and lightly. Bren, with less than a quarter of her accustomed weight, glided about as though dancing.

They passed a high bench carrying some strange apparatus. "Before we go on," said Harlow, "I want you to look at this. It's a microscope."

Scott, standing on a box which Harlow had evidently placed in front of the desk, looked at the thing. As he did so a curious chill crept down his spine. The device

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had three eyepieces, arranged in a triangle. Placed as it was, it could only have been used by someone—or something—much taller than any man. He glanced uneasily in both directions along the gloomy corridor.

Harlow laughed. "The normal reaction. I did it, too, but don't worry. The whole place is deserted."

"Deserted for how long?" asked Scott.

"Who knows? Perhaps for a lifetime. Perhaps for ten thousand years. The metals they used don't corrode in methane, and until we got the locks open no dust could filter in."

Scott walked along beside the benches. "Maybe ten thousand years. On the other hand, these—these people could have left the day before the First Expedition arrived?"

"Theoretically—yes."

Scott again looked in each direction along the vast corridor. "Where's the electronic gear you found? I'd like to get a quick look at it and get the hell out of here."

Harlow laughed again. "I know how you feel. But fifty years of archaeological work have broken me out of that habit of thinking."

"Maybe. But there's still the Alliance ship on its way here."

"Right. I'll take you straight to my main exhibit."

Harlow led the way on, turning at right angles into another corridor that joined the first, then turning again into an intersecting hall, this time with no windows, its depth a yawning blackness. Harlow's voice echoed hollowly from far-off metal walls.

"I've rigged up lights here. One moment."

Suddenly the hall was flooded with light. Scott gave a shout of amazement.

He was looking at something that could only have been some form of aircraft or spacecraft. Yet it was unlike any other craft he had ever seen. Spindle-shaped, pointed at either end, eighty or ninety feet long, with fins at the tail and amidships, it looked like an ultra-modern sculptor's conception of a shark. Its smooth hull was built entirely of some unfamiliar green metal, giving the appearance of having been cast in one piece, its surface broken only by slitted crystalline ports and an open airlock door amidships.

He became dully aware of Harlow's voice: "Why they abandoned their ship, I don't know, although I suspect they were overhauling part of its drive mechanism. That's far beyond my knowledge of electronics, by the way. That's why I sent my message."

Scott walked down alongside the alien ship, his steps ringing on the metal floor. The airlock was large, suggesting that it had been built for something with a body much bigger than a human body.

"Come aboard," said Harlow, climbing improvised steps to the airlock.

Inside, the ship was lit by a faint,

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luminous glow that shone coldly from the metal surfaces of bulkheads and ceilings. Just aft of the entrance-door, Harlow pointed out a set of polyhedral wire screens that seemed to shimmer, as though slightly unreal. Within them was enclosed a ten-foot globe of midnight blackness, blacker than any object Scott had ever imagined, as though it absorbed every particle of light which struck it.

"Those screens appear to be charged energy-shields," said Harlow. "The black globe is their main power-source. I wouldn't advise dismantling the screens to find out what's inside—see the thickness of insulation on the power outlets? And their insulators have a better dielectric than anything we know."

Scott moved forward to the control room.

"God!" he said when he saw it.

"What is it?" asked Bren from behind him.

He pointed to the control-seat. "What sort of thing used *that?*"

Harlow moved alongside him. "I've often speculated about that. Even tried to draw it. Gave it up after a few attempts. Might have been frightened to come back here."

Scott sat at the controls, looking at the shining levers and strangely marked dials of incomprehensible instruments. He was silent for a long time.

"You know," he said at last. "I'm going to try to fly this thing."

"Good Lord, man, why?" Harlow strode across to him. "Why not photograph what you want, take the movable equipment you can get out of it, and leave it here?"

"I can't move the power-source. And I can't move those energy-screens. If I leave them here, the Alliance people will find the thing, and maybe *they'll* find some way of getting it to fly." He sighed. "I don't like the job, but it's the only way. I'm going to fly this thing back to Earth."

"Alone?"

"Yes. Miss Galt can get you back in the J4."

"You've got to get this thing going, first," said Bren. "It mightn't be usable. Why was it left here?"

"That's the first thing I'm going to find out."

Scott spent hour after hour tracing the control circuits of the ship. The fine, thinly-insulated wires connecting the various instruments were differently colored. Some of the combinations of shades were very hard to distinguish, as they must have been intended for recognition by eyes with a different color-sense than human eyes. But the colors, once isolated, proved a reliable guide, and he was able to label the dials on the panels to indicate which of them referred to each function of the ship.

Parts from the ship's mechanism were lying on benches along the side of the hall. Some of these he replaced, with the help of Harlow and Bren, fitting them in like elements of a puzzle.

As far as they could make out,

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the ship had operated by some form of anti-gravity principle. There were screens in the ceiling and floor of the cabin, and vertical screens fore and aft of it. Scott found that a certain switch allowed current to feed from the power-source to a form of electric motor driving a thing rather like an alternator, but evidently different in purpose. When he threw the switch in, the motor hummed, and the machine linked to it set a ring of violent sparks fluttering about a commutator visible through its transparent housing. Scott turned a dial on the control-panel connected with the machine and with the screens. He felt unaccountably heavier.

Thinking the ship was moving vertically, he hastily reversed the dial. He felt lighter. As he turned the dial further to the left he had the sensation of weightlessness, as though he were in free fall. He centralized the dial, bringing his weight back to normal.

The screens must constitute some form of gravity-shield—or they produced a force similar in nature to a gravity-field.

The sweat stood out on his forehead. It was no longer a case of *trying* to fly the alien ship back to Earth. *He had to fly it back!*

He had stumbled on something bigger than he had thought. Something that opened up vast horizons. The conquest of deep space . . .

He showed the discovery to Harlow and to Bren. They worked on in tense haste until Harlow suggested they break off for some rest.

"This thing's too important—I'm keeping right on," said Scott. "You two go back to the dome."

"Right," said Harlow tiredly. "Coming?" he asked Bren.

"I'm staying with Rick," she said.

Harlow went back along the corridor out of sight. Scott continued with his tedious elimination of circuit after circuit, gradually retrieving part by part of the equipment scattered on the benches outside, and fitting it into position. Most of the parts were held in place by strangely-shaped bolts which evidently should have had some kind of power-tool to tighten them, and Scott had to improvise a wrench to fit. When he had pulled them home as hard as he thought humanly possible, Bren invariably managed to tighten them a shade further.

Then Scott made the discovery that their entire effort was going to end in failure. One of the generators feeding power to the main lifting screens was inoperable. The central shaft of the thing refused to turn in its bearings. Carefully he dismantled the housing, and they found one of the bearings a half-fused mass of broken metal.

"What now?" asked Bren, sitting back on her heels.

"This is the finish. This is what immobilized the ship—what they weren't able to repair."

"No way you can fix it?"

"If I had a lathe, I could turn down one of the spare bearings of the J4's gyro-rotors. But without

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machines—" He spread his hands wide.

They sat in silence for a time. Suddenly Harlow's voice came through the radio. "Captain Scott. I'm picking up a blip on the radar. Something out in space. In an orbit around Triton."

"That's all it needs," said Scott bitterly. "That'll be the Alliance ship."

"I've shut off any light that might show—it's night outside here, you know. But they'll find us as soon as the daylight shows your ship."

"O.K.," said Scott. "We'll come out to the dome."

Back in the dome, Scott told Harlow about the generator. "If I could get that ship back to Earth," he said, "We could win any war that would be likely to develop."

"I wonder," said Harlow thoughtfully.

"No doubt in my mind," replied Scott.

"Captain Scott, as an achaeologist, I might consider myself something of an expert in history. History in the long term. The history of the rise and fall of civilizations."

Scott nodded wearily.

"I don't think any single weapon would be the answer today. Each faction on Earth has sufficient fusion bombs to obliterate not only its rival, but the whole of life on the surface of the planet."

Scott looked at him sombrely without comment.

"What would happen if either side were forced into a position where military defeat was obvious?"

Scott was reluctant to speak.

"What would happen?" persisted Harlow.

"They'd try for a quick knockout."

"Exactly. Whichever way the initial advantage might lie. And what would be the end result of a knockout blow with modern weapons?"

Scott stared blankly before him. "It would be bad. Only a handful surviving on each side. Probably living underground."

"The *end* result?" pursued Harlow.

"Well, they'd come out and start over, after a time."

"With the fall-out coming down twenty, fifty years later?"

"Well, they'd have to come out eventually."

"For what?"

"For food."

"What food?"

Scott's eyes were fixed on Harlow as if he were looking through him. Very slowly, Harlow nodded.

"You see?" he said. "There could be only one end result. Absolute extinction of life throughout the planet. Not for a year. Not for a generation. Forever, man! Forever!"

Early on the next day, they watched from the airlock of the alien building as the Eastern Alliance ship landed, dropping on its howling rocket blast within half a mile

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of the J4, further across the plain. It was painted half white and half international orange—a larger ship than the J4, though apparently less powerful.

"Must be one of their survey ships," said Scott. "Funny, I hadn't thought of that. That explains why it didn't have the speed of one of their cruisers—they must have sent the ship that happened to be nearest, regardless of type or purpose."

"Wait here," said Harlow. "Inside the buildings. I'll meet them alone."

"They know we're here. They've seen the J4."

"I'll keep in touch with you by radio," said Harlow, and then he was off towards the dome.

Through Harlow's binoculars, Scott saw three figures climb down the slender ladder of the white and orange ship. They waited there while Harlow drove across to meet them in the runabout. When he reached them, Scott could see nothing but a close group of figures alongside the machine. Then Harlow drove back, with two of the Alliance men aboard, one of them remaining at the foot of the ladder.

"Anybody's guess what's going on there," he told Bren. He turned his glasses on the solitary figure near the Alliance ship. The man was moving about. As he turned, the sun flashed on bright metal.

"The fellow on guard's carrying a gun. Probably all are."

"What are you going to do?"

"I—" Suddenly Scott drove his fist into his palm. "Got it!" He seized her by the arm. "Quick! Back to the alien ship."

"Why?"

"You'll see. Can you run?"

He raced down the long corridor. To his surprise, Bren kept up with him easily in the light Triton gravity. In fact, she was ahead of him part of the way, the quick thrusts of her legs sending her forward in giant strides.

Inside the alien ship, Scott flicked the switch that activated the generator of the ceiling and floor screens. "Did you say you can take 16G?" he asked.

"Yes. Maybe more."

"How much can you take in a standing position?"

"I don't know. At home I go about under 2½G all the time. Maybe I could take five or six."

"Good. That's more than I can stand up to, or any of the fellows from the Alliance ship. If they look for this ship, we'll let them find it. We'll let them come right in here, guns and all. Then we'll hit them with 5G. Think you can take it from there?"

Her face was pale. "Better try me out," she said.

Scott sat in the seat, leaning back to give his neck and spine plenty of support. Bren stood in the middle of the floor. He slowly turned the dial of the gravity-field of the cabin.

The pressure forced him down hard in the seat. The girl took a couple of short, very quick steps as

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she braced herself. She seemed to lose an inch or so in stature.

"All right?" he asked anxiously.

"Of course," she said a little irritably. "That's not up to Jupiter normal."

He turned the dial steadily further. She smiled impatiently.

"Here. Let me do that." She walked across the metal floor, her body rigidly erect, moving with incredible speed. Her strides were short, but very swift, her legs blurred with their quickness of movement, her erect body giving the impression of gliding across the room as though propelled by a violent thrust from behind. Scott had the illusion of watching a film run through a projector at perhaps three times its normal speed.

He tried to lift his arm, but it was like dead. She lifted her hand without apparent exertion and turned the dial further, much further to the right. The light took on a reddish tinge that told Scott he was not far from blackout.

"All right?" he asked.

"Course - I'm - all - right!" The words were run together like a single word.

"Can you lift your arm?"

She clenched her hand and lifted it to shoulder level, her arm bent, biceps swelling. Suddenly she shot it vertically above her head, then lowered it again.

He looked at the dial, but couldn't lift his hand to it. The rapid beat of hard footsteps rattled across the cabin, and she reached past him, still keeping her body tensely erect, turning the dial slightly to the right, then all the way back to the left. The pressure came off. She seemed to gain a couple of inches in height. Scott took a deep breath.

Scott went outside the ship and returned with a sheet of thin metal panelling which he had removed from one of the bulkheads to get at the wiring. He stood it up so that it hid the control-seat from the entrance to the cabin, jamming it in place with metal rods which he had found outside.

"Now," he said. "When I bring them into the control-room, you'll be here. Generator running—if they hear the motor I'll give some explanation. When I call your name, turn the dial to this mark—the figure that looks like a reversed K with a bend in it."

"What happens if you're in the field?"

"It'll flatten the lot of us, except you. Won't hurt me—I'll be ready for it."

"What then?"

"Any sign of fight in them, you reverse the field, then put the pressure on again. Twice, three times."

"I see. Hope it works."

"It's got to work." Scott looked at his watch. "I'll leave you here. Might be a long time—but don't get away."

"I'll be here. Might practise a bit of walking under heavy gravity while you're gone."

"O.K. But be careful."

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"*You* had better be careful!"

As Scott approached the dome he felt a sense of mounting tension. He approached cautiously. Through one of the ports he could see the head and shoulders of Harlow, who was standing with a glass of some drink in his hand, relaxed, talking. As Scott watched, Harlow evidently reached the climax of what he was saying, and burst into laughter.

Scott edged round to see who else was in the room. There were two men in gray space-suits, helmets off, one a giant of a man with a heavy brown beard, the other much younger, lean and cold-looking, the tightness about his eyes and mouth somehow wolfish. The big man was seated at the table, a filled glass before him and a bottle near at hand. The younger man stood near the door of the airlock, leaning against the wall, a deadly-looking solenoid rifle by his side.

Scott was unable to hear what was being said, but Harlow and the bearded man seemed to be on the best of terms. Nothing could be gained by standing outside—the man guarding the ship had no doubt seen him emerge from the alien building, and would communicate with the others if he acted suspiciously. He pressed the button alongside the airlock.

When he stepped through the inner door, the younger of the two men in gray was standing just inside, the solenoid rifle in his hands.

"Ah, Captain Scott," said Harlow. "I'd like you to meet Professor Sanin. We've known each other on and off for years. When we were working on the ruins north of the Lacus Solis we pooled our equipment and our discoveries all the time."

The bearded man extended his hand to Scott. "Pleasure to meet any fren' of Professor Harlow," he rumbled in a deep bass. He waved his hand to include the younger man. "My pilot, Lieutenant Keljuk."

Keljuk nodded stiffly to Scott, still holding his rifle.

"It seems," said Sanin ponderously, "my government has given me a task I don' like." He shrugged his shoulders. "I am geologist, geophysicist, vulcanologist. Not a soldier." He turned to look at his pilot. "Not like Keljuk, here. He's a fine boy, but he can't forget he's not still in the army."

"Just what is your task, Professor Sanin?" asked Scott evenly.

"You must know that. But look—we are scientific expeditions, yes? Professor Harlow and I, we know each other long time. Best we put all the cards on the table, yes?"

Scott nodded. "Nothing we could hide for long in a place like this."

"So. We are exploring surface of one of outer asteroids—Hidalgo, way out beyond Jupiter orbit. We get your message, we relay it. Our people decode, order us here. Discovery of military importance. Other ships coming—cruisers—but we are nearest. We are to find what this discovery is."

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"We've just been talking about the war threat," broke in Harlow. "Professor Sanin is inclined to agree with me—a war with modern weapons could mean the extinction of life on Earth."

"So," agreed Sanin. "Trouble is, Keljuk here is still a soldier—eh, Mitka?" He looked at his companion.

"This is a national emergency," Keljuk replied coldly.

Scott came to a sudden decision. "I wouldn't say it's of great military importance," he said. "But I'll show it to you if you wish. Tell me, though, would you do something for me in return?"

The three of them looked at him in silence.

"I've damaged a generator bearing on my ship." He nodded towards the J4, visible through one of the windows. "Have you a maintenance shop aboard your ship? I want the use of a lathe to turn down a new bearing."

"Sure," said Sanin. "We could fix that. Federation machinery not so good sometimes, eh?" He laughed gustily.

"Sometimes," agreed Scott.

"Now," said Keljuk. "Could we see what you've found?"

Scott led the three of them back through the long corridors of the alien buildings. Sanin wanted to stop and look at everything he passed. He talked volubly with Harlow the whole way. Keljuk stalked along in silence beside Scott, his rifle at the ready.

When they came in sight of the alien ship, they were as stunned as Scott had been.

"But," burst out Keljuk, "how could a planet like Triton produce a culture like this?"

"It didn't," pointed out Sanin. "These people came from somewhere else."

Suddenly Scott stepped in front of the other three.

"Listen!" he said tensely. "Listen to me a minute."

They watched him in silence. He walked up and down a few paces, then stood facing them.

"What would happen if a ship like this were to appear suddenly in the Earth's atmosphere?"

"If it were over Washington, New York, Rio, everyone say it's an Alliance ship. If over an Alliance city, everyone say it's a Federation ship." Sanin gestured with both hands.

"But if it appeared over cities in both groups of countries? About the same time?"

Silence for a moment. This time it was Harlow who spoke first. "They'd have to agree it was an alien ship.

"Exactly," said Scott. "And to reinforce the idea, suppose it broadcast some kind of ultimatum—we'd have to work that out—telling the population of the Earth to prepare for contact by some force from beyond the Solar System—some force vastly more powerful than either the Alliance *or* the Federation. What then?"

"It would never work," said Kel-

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juk. "They'd realize it was a trick. They'd recognize human voices."

"We could manage it in several languages, between us," interposed Harlow.

"They'd still recognize voices," persisted Keljuk.

"Wait a minute," Scott held up his hand. "Suppose we taped the voices, and modified the sound?"

"Still recognizable," Keljuk gestured with his rifle. "Let's go aboard."

Scott led the way into the control cabin, with Keljuk behind him. Keljuk's narrowed eyes took in the dismantled housing of the generator as they passed it. "So that's why you wanted the use of our lathe. Will this thing fly if that's fixed?"

"Maybe," said Scott.

Keljuk moved quickly to one side of the cabin, spinning to face the other three.

"One moment," he said. The rifle rested menacingly across his arm. "I don't think this plan of Captain Scott's will work. And if it doesn't, the ship could as easily fall into Federation hands as into ours."

"Don't be dramatic, Mitka," rumbled Sanin. "I think it's worth considering. May work. May not. If it does, we've stopped a war that we agree will finish both our countries. Probably finish human life. If it don' work —" He spread his arms wide. "At least, we tried to do something bigger than anyone has really tried before."

Keljuk lifted his rifle slightly. "I'm sorry, Professor. I regard this as a national emergency. I'm taking command."

"Bren!" Scott shouted. "*Now!*"

The gravity-field hit them with an almost stunning violence. Scott's knees buckled under him, and he found himself on his haunches, hands braced against the floor. Keljuk had dropped in the same way, but his rifle was still across his knees. Lips bared, he made a tremendous effort to swing it around. The barrel moved slowly, as Scott tried to edge towards him.

Suddenly the force came off. More prepared, Scott sprang at Keljuk and grappled with him. The force came on again, and the two of them fell —Bren had timed it so that Scott was uppermost. Keljuk gave a sharp cry. When the pressure came off again, Scott rose with the rifle. He was the only one standing among the four of them.

Bren moved out from behind the screen, white-faced. "All right?" she asked.

Keljuk rolled over, wincing, holding his right forearm. Their combined weight in the fall, multiplied by a factor of three or four, had apparently broken it. His face looked yellowish, waxen.

Harlow and Sanin lay still, half-conscious. Scott handed the rifle to Bren, helped Harlow to his feet, then Sanin.

"Sorry," he said. "Matter of emergency."

The bearing was turned down in the Alliance craft's compact little

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machine-shop without difficulty, and fitted into the alien craft. Scott rolled back the sliding roof of the hall in which it was placed, and experimented carefully with the anti-gravity drive. He would have liked to have taken more time to become familiar with the controls, but time was beyond price.

He transferred the J4's radio equipment into the alien ship, and altered a transformer to enable it to draw power from the ship's source. Harlow and Sanin recorded their voices on tapes in four different languages, giving a carefully-prepared message stating that these were the words of the Xetri—a name of Harlow's devising—and that they wished to contact the population of the Earth with a view to incorporating it into their own—and growing—Galactic organization.

"No," said Scott as he listened to the tapes in the dome. "They'd recognize that."

"Why don't you do it properly, if you must go ahead with this madness." The interruption came from Keljuk, who was lying on Harlow's bunk at the side of the dome; Sanin had set the break in his arm, and there was nowhere else to leave him until he had recuperated.

"Any suggestions?" asked Scott icily.

"Yes. We have film aboard our ship. Ever heard of a painted sound-track?"

The others looked at Keljuk in astonishment. Since he had been overpowered in the struggle, he had said nothing beyond an occasional monosyllable.

"You want a non-human voice, right? Talk your messages on to a sound track. Then paint another sound-track to duplicate it fairly closely, not exactly."

"It would sound artificial," protested Harlow.

"That's what you want, isn't it? What would an alien race do, if it had learned our languages and wanted to reproduce a human voice? It would use some mechanical device, wouldn't it?"

They exchanged glances.

"He's right," said Scott. Suddenly he went across to Keljuk, and held out his hand near Keljuk's free one. "Guess I misjudged you. Thanks."

Keljuk ignored his hand. "I'm not thinking of you. I'm thinking of my own people. There's just a chance that your idea might work, crazy as it is. If you must do it, it had better succeed."

Scott packed a large supply of food concentrates in the alien ship. He wasn't certain when he could land again, and Harlow had stocks left by the second expedition which he would no longer need. The alien ship handled well, when he became somewhat used to the controls. He had to shift the control-seat forward eighteen inches to bring himself within comfortable reach of the levers and switches and the complex system of dials.

He would have to work out his own system of navigation. Among the instruments was a transparent

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globe containing a free-floating inner globe, half white and half black, pierced by a hole along its axis. Wherever the ship was placed, the white half pointed to a fixed location in space, somewhere in the constellation of Sagittarius.

At last, he had everything ready to leave. He climbed into his space-suit, shook hands with Harlow and Sanin, and looked round for Bren.

He called her. He heard her voice from the distance, and a minute later she came into the corridor in her space-suit, helmet under her arm.

"I'm coming with you," she said.

"But this might be dangerous."

"It's not safe alone. You must sleep some of the time. You need another person aboard, and I'm the obvious choice."

Scott hesitated, then grinned. "Get aboard," he said.

The gravity screens fore and aft of the cabin were geared to compensate for any inertia effects, completely nullifying the shock of acceleration. As soon as Harlow had rolled back the roof of the hall, Scott put the ship into vertical climb. Within, there was no sensation of movement whatever—only the dropping away of the frigid landscape of Triton in the superb vision-screens.

He headed towards the distant Sun. The speed of the ship was almost incredible—without using anything approaching full power, and without any sense of acceleration, he shot away from the satellite with such velocity that in the rear screens it looked like a lighted pebble dropping into a dark well. The larger greenish ball of Neptune dropped with it, the two dwindling into a single remote star in an unbelievably short space of time.

The ship had something resembling radar—Scott hadn't found out how it worked, but he could see that its screens picked up solid objects. Its range he didn't know, as it was graduated in units strange to him, but he decided to check it by known distances as soon as the chance presented itself.

A few brief watches brought them within the orbit of the Moon, swinging around the Earth. Full out, the ship would undoubtedly have been capable of speeds approaching that of light, or perhaps vastly exceeding it—the fact that its makers had come from somewhere beyond the Solar System seemed to suggest that.

The vertical gravitational control made atmospheric manoeuvering easy. And some form of repulsion-screen, veiling the outside of the ship with what might have been free electronic matter held in a field, made tremendous speeds possible through air.

Scott began his broadcasts, using the power-source of the ship to slam his message across all the frequently-used wave-bands on terrestrial radio-stations. He listened to the weird, metallic voices of the painted sound-tracks with a smile, imagining the effect below him.

He made low runs over a dozen of the Earth's largest cities, showing the alien ship briefly to hundreds of thousands of people. Between ap-

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pearances, he climbed high and used the ship's meteoric speed to take him half-way round the globe, choosing his dives into the lower atmosphere at random.

Out in space again, he listened to the confused reports on a hundred radio-stations throughout the world. Emergency news broadcasts breaking into every programme. The results were better than he had imagined. It was universally assumed that not one, but many ships had been responsible for the sudden appearances, the broadcasts from above the atmosphere.

He repeated the process, showing the ship in twenty, thirty, fifty centres of population, always appearing, hovering for seconds only, then leaping away into the upper blue. Twelve hours later, when the other half of the planet was in sunshine, he repeated his appearances again in the other hemisphere.

He retired well out in orbit to listen again to the results, grinning at Bren as he spun the dial of the radio.

"Latest on the Invasion from Space!" The announcer's voice over the Federation network was high, tense. "No further sightings have been reported in the last hour of the mysterious armada of green spacecraft which have appeared at various points in the Earth's atmosphere many hundreds of times since midday yesterday. Reports of earlier sightings are still coming in to the Central Emergency Committee set up in Washington to correlate data.

"Little is known of the green ships beyond the fact that they are spindle-shaped and in a few cases apparently saucer-shaped, varying in estimated size from fifty to five-hundred feet in length. Reports of simultaneous appearances over the Eastern Alliance countries has effectively disproved the early theory that the ships might have been of terrestrial origin.

"The total number of reports has already run into many thousands. Some, which gave accounts of strange ships landing in various places, and gigantic men with antennae, or sometimes in grotesque armor, have been discounted as fictitious. So far, no report of an actual landing has been authenticated.

"However, it is generally agreed by experts that the craft are of non-human origin. In many cases, they have been seen to manoeuver with a violence that the human body could not possibly withstand.

"Professor Channing, noted authority on space medicine, stated that this manoeuverability might mean either of two things—that the ships were flown by beings of very different physical structure from ourselves, or that they are operated by fantastically efficient systems of remote control. . . .

"Suggestion for Pooling of Knowledge!

"It has been rumored in the highest governmental circles that a suggestion is being drafted for a pooling of knowledge on space-warfare techniques by the Federation

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and the Eastern Alliance. If humanity is threatened by invasion of an unknown enemy from beyond the known planets, it might well be necessary to share every scrap of knowledge turned up by research in all countries for the survival of the race as a whole."

Scott looked at Bren. "Better than we ever dreamed," he said.

"What now?"

"Back to Triton. We can leave this ship orbiting out beyond Neptune, where only we can find it again. Shouldn't be too hard for one of us to transfer to the J4 in space —the other will have to match orbits in the J4, but we make a good team." He grinned. "We'll leave this ship in an orbit at a steep angle to the ecliptic, then fly home in the J4 and put in our report on the buildings —not on the ship."

Bren walked across to one of the ports, and stood looking out at the star-dusted immensity of the Sagittarius clouds, where the black and white compass sphere always pointed.

"I wonder if *they* are still flying space, somewhere out there," she said, half to herself.

"Time is long," said Scott. "My guess is that they haven't been this way for thousands of years."

"I suppose you're right." She stood motionless, still looking out. "I've liked working with you, Rick."

He went across to her, lifted her bodily and placed her so that she was standing on a step near the control-seat. When she turned their faces were almost on a level. He put his arms round her, holding her against him. "Like to go on working with me?" he asked.

She nodded her head.

"Like to make your home on a freighter?"

She nodded again.

"Then we've a lot to talk about. But first —" He leaned forward and pressed his lips hard against hers. Her body stiffened, then relaxed, then became fiercely alive, her arm tightening about him. . . .

They made part of the run out to Triton at a tenth of the speed of light. In an incredibly short space of time, they were swinging in orbit above its barren surface again.

"They haven't got the beacon flashing" said Bren, looking at the screen.

"Don't expect us back yet. I'll give them the call-sign."

But the radio brought no response. They went on circling over the ammonia plains and jagged mountains.

"Wasn't that the landing place?" asked Bren.

"I thought so. But I don't see the ships. It can't be."

But it was. Scott was forced to admit it to himself after making another circuit. He brought the ship carefully down, close to Harlow's aluminum dome. The airlock of the dome stood open—both doors of it.

"I don't like it," said Scott, traversing the horizon with the screens. He climbed hastily into his spacesuit, Bren doing likewise.

"Better wait here," he said. "I'll take a look around."

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"Please, Rick. I'm coming with you."

"O.K. But stick close to me."

They walked across to the dome. At the door, Scott halted sharply. The place was empty—stripped of everything movable.

They walked into the alien buildings, their steps echoing eerily along the empty vastness of the corridors. As they passed the benches where the triple microscope and other devices had stood, Scott noticed that they, too, had been stripped clean.

"Do you suppose the Alliance cruiser got here, after all?" asked Bren.

"Can't understand it. They'd have needed a fleet to move all this gear. And it would have taken them days. Weeks."

She moved close alongside him. "Rick."

"What is it?"

"Let's get out of here."

"In a minute. I'm checking for any sign they may have left."

"Let's get out now. I'm frightened."

"But there's no one here now."

Her voice rose suddenly higher. "You know as well as I do that was no Alliance cruiser that came here. Let's go. Quickly."

He looked searchingly round. "O.K.," he said.

They retraced their steps. As they reached the outer door, Bren suddenly screamed. Scott jumped. He had never imagined he would hear her screaming.

"Look!" She pointed at the ammonia snow at their feet. Their footprints were visible all the way from the dome, in the slanting sunlight. Beside them were the older prints of Harlow, Sanin, Keljuk and themselves, made when they had last been here. And then he saw the other prints.

They ran across the older marks at many points. Footprints that had been put there since they had left for Earth. Deep marks that were not the footprints of human beings, but of — other things. Shod prints, but of strange shape. Longer than a man's, and divided into three widely-splayed toes.

His blood froze like ice, he followed them fifty yards across the frozen surface, trying to match their seven-foot strides. Then they ended. Beyond were two long, straight depressions crushed into the surface, like the skid-marks of a colossal ship.

Neither spoke until they were back in the control-cabin. Then Scott looked up through the ports at the unwinking billions of stars.

"God!" he said. "I tried to stop a war. *But what now?*" . . .

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search for life

by . . . Clyde Hostetter

It will be a lonely world—once man is gone—a lonely and frightening world if you also wonder about Tomorrow . . .

"WE HAVE one chance for survival," Professor Ekab Zlickok somberly telepathed to his class in Social Engineering, choosing a low frequency for emphasis. "Somewhere among the life-forms on this planet there may be the new intellectual stock that can save us from destruction. Our explorations thus far have uncovered no trace of it."

He gestured at the three-dimensional projectors beside him. Quickly the lights of the college classroom dimmed, and a field of waving corn surrounded the class.

"Some of you have seen vegetation specimens like these," Professor Zlickok continued. "They were quite common prior to the First Atomic Wars, and were a common source of nourishment to early man. The hybrid corn produced in the pre-Atomic Age, we are told, came from a careful cross-breeding process that utilized the best genetic characteristics of several corn plants."

The professor gestured once more and the room brightened.

"Our problem, as you know," he proceeded, once more shifting into the lower frequencies, "evolves from the fact that there is no breeding stock other than our own to which

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Clyde Hostetter is on the administrative staff of a State College in California. Former associate editor of Town Journal *(the old* Pathfinder*), he was, before joining the College, public relations consultant for a major electronics firm on the west coast. A last PR assignment was to publicize a new "automatic factory."*

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we can turn to release us from our bred-in intellectual limitations. Unless this new stock can be discovered, our culture is doomed."

He stared out at the rows of students before him, and as always felt that he was viewing the multiple reflections of a cracked mirror. More than 65 faces identical to his own stared back at him. What better reminder of the fact that chromosone patterns were rigidly fixed, with mutations from whatever source unheard of?

The bell sounded and the class filed silently out. Professor Zlickok shuffled wearily over to his desk.

Man had had the necessary spark of genius in the Old Days, he reflected. He had unleashed atomic power, perfected ionic space drives and tinkered with electronic genetics, producing pseudo-life forms that survived on electrical energy instead of conventional nourishment. Man had even produced a subhuman race of "living" robots with mental characteristics carefully limited to make them willing servants of mankind.

Professor Zlickok shook his head sadly. Perhaps the new race of slaves without souls had been man's undoing, he speculated. With robot armies to fight his wars, he had been careless about atomic warfare. Suddenly the Earth's atmospheric envelope had become poisoned with radioactivity too deadly for man to continue to survive. Then the vast fleets of spaceships roared off in search of uncontaminated planets, leaving silent robots in possession of the planet. The atomic power generators still hummed, supplying the robots with their life, so life went on.

Was it cruel to leave the robot race behind with no knowledge of how to maintain the generators upon which their existence depended? Professor Zlickok speculated on the question as he had so many times before. Could man be cruel to a soulless electronic mass of his own creation?

The warning red light flickered on the brooding professor's retina. Automatically he slipped the charging plug from its receptacle. Sooner or later the generators would fail, and no one would have the capacity to repair them. He snapped the charging plug into the wall socket and felt new life surge through him once more. What would it be like, he wondered idly, to feel the fatal ebbing away to Battery Zero—dying with your brothers in a forgotten world?

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lap of the primitive

by . . . William F. Nolan

Why not spend their honeymoon running free and unbridled—like young gazelles—in the jungles of Venus? Imagine!

ALTHOUGH the passenger rocket's tumultous departure seemed to delight her new husband, Tildy Perchall found Blast-Off a singularly unpleasant experience.

"Well, kid, how do you feel, eh?" Phineas asked as they shot away from Earth. He grinned broadly. "Now, wasn't that keen?"

"I feel as if an elephant sat on my chest," she said.

"Boy! They really sparkle out there, don't they?" enthused Phineas, pressing his nose against the port and squinting at the stars. "I mean, they *glitter!*"

Tildy stared unhappily at the man she had so recently married; at his scratchy moustache, like a patch of brown weed under his long nose; at his small pig eyes and disappointing ears; and at the sparse beginnings of a beard on his weak, recessive chin.

Phineas was not only a bore, she reluctantly admitted, but he was positively *ugly!* Still, Tildy knew she had no business being particular.

Sadly she examined her own reflection in the dark port glass. Good features, basically. Attractive white teeth, naturally curly blonde hair, soft doe eyes and full lips. Framed

Phineas Perchall lived a rich life—vicariously—in the adventures of others. Tildy found it extremely depressing to be married to this boring little man, with his disappointing ears and more disappointing chin— until she met the man of her *dreams! W. F. Nolan is well-known in SF circles on the West Coast.*

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in the liquid depths of the port, her face was beautiful—as a peach swollen with summer juices is beautiful.

Then she looked down. The rest of her body flowed beneath like a pink sea and she told herself, once again, considering her incredible poundage she was lucky to have landed even Phineas in the competitive game of Man-catching.

Sighing, she studied the other passengers. Greasy space rats. Waspish school teachers on vacation. Fox-faced salesmen and ulcered business moguls. The fact that they were all rather unattractive comforted her somewhat.

"Are you *sure* the moon is warm?" she asked Phineas. "I could just bet it isn't. Ellie Fullbrick says it just gets terribly awfully cold up there at night. She said that if—"

"You can forget the moon," Phineas Perchall announced. "Utterly dismiss its depressingly pocked face from your mind. We are not headed for the moon at all."

Tildy was confused. She blinked. "Then—where *are* we going?"

"Surprise!" smiled Phineas "Idea came to me right in the middle of APE, FRUITFLY AND YOU. Great book. I suddenly realized how stagnant, how dormant and suffocating life has been, how we all subconsciously yearn to burst our fetters and unite with the animal kingdom."

"But, Phineas . . ."

"Boliver Chadwick gave me this colossal idea. Fellow that wrote the book. Anthropologist, you know. Big. Over two hundred pounds. Full of odd facts. Knows all about the Hawk Indians, for example."

"But, what have the Hawk Indians to do with our honeymoon?"

"At the end of chapter fourteen my subconscious whispered," Phineas went on, his voice excited and high. "Why spend our honeymoon in lacklustre surroundings? The Moon is old hat; Mars is a bore. But, ah, what of the Evening Star? What of Venus? Why not spend our honeymoon running free and unbridled like young gazelles in the jungles of Venus? Imagine, two full weeks in the lap of the primitive!"

Tildy thought of a camping trip she'd once taken as a Brownie. Out in the wind, chilled and uncomfortable, rained on and bitten by insects which seemed to find her ample flesh a special culinary delight. "It rains on Venus," she protested. "I read about it. Terrible rain most of the time."

"Rain is a fine unbridled process—a letting-down, as it were, of Nature's hair—a pouring-forth—"

"Bugs," Tildy moaned. "There must be all kinds of new bugs up there. We could be stung to death—or even eaten alive."

"Nonsense. Chadwick was absolutely right when he wrote: 'Life's dull plodding must occasionally be enlivened by the extraordinary.' "

Tildy felt herself going under in the torrential sea of her husband's argument. Phineas swept on.

"Adventure is what we're after. The challenge of the great outdoors. The clash of fang against fang!"

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Tildy imagined an alien fang imbedded in her pink leg. She moaned softly. "But, Phineas, your job. We simply can't be going all the way to Venus!"

"Of course we can," he grinned. "This ship is equipped with the Shackley Solardrive Unit. Why, we're halfway there already. Gad, I feel seventeen again!"

Tildey sighed, resigned herself, and said nothing.

Free Fall proved to be immeasurably entertaining. Tildy adored drifting about the cabin, free of gravity, propelling herself, with a single fat finger jab, from wall to wall. Looking down at her solid rotundity, air-borne and light as thistle, she was continually amazed that so much of her managed to stay up there, suspended above the seats.

Drifting and swirling like a lazy feather, she imagined herself a candle-thin fashion model, swathed in ermine and silk, posing for exclusive magazines. She could almost feel the looped pearls about her throat.

And then Phineas spoiled it all.

Swimming into the center of the cabin, he began to sing lustily.

"Row, Row, Row your boat,
Gently down the stream . . .
Merrily, Merrily, Merrily, Merrily,
Life is but a dream . . ."

A woman with hair like streaming confetti propelled herself up to join in the chorus. A space rat added his nasal twang to the din as the entire cabin boomed with song.

Tildy floated wearily back to her seat, crushed in a winepress of Merrilys. She strapped herself in and closed her eyes against the sight of Phineas, whose open mouth somehow resembled a decorated Easter egg.

Bells, buzzers, flashing lights, released pressures—and a final jarring thump.

"Well, kid," said Phineas, smacking his palms together, "we're down."

"That was a terrible landing," Tildy said, after the solar engines had stilled. "I must have broken something." She felt gingerly of her deep-sunk bones.

"Posh! Let us disembark to greet a new world. Old Mother Earth is nothing more than a single lost grain of sand on the trackless beach of the Universe. Venus, the Evening Star, bids us welcome!"

Outside the rocket, the rain spatted down from a leaden sky. Tildy gazed at the soaked jungle rising in a leafy tide beyond the perimeter of the landing area. Under the beating rain the trees lashed and twisted; odd web-leafed bushes glinted balefully; furry creatures whipped bullet-quick through matted undergrowth.

Tildy shuddered.

She turned to face a hurrying little man with a basket on his arm. He came smiling forward to meet them as they descended from the rocket with the other passengers. From the basket, the little man dropped wreaths over each of the female visi-

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tors. He then led them toward the depot—an immense, bubble-like structure at the clearing's edge.

Phineas led Tildy immediately to the main information desk.

"We intend to live as our primitive forefathers lived before us," he announced to the slim young man behind the desk, "shorn of artificial luxuries and stripped to essentials."

The clerk squinted at Phineas.

"I want all the available information pertaining to big-game hunting," Phineas said. "We've got to live by our wits out there you know."

"Out *where?*" asked the clerk.

"In the bush, boy. The untrammeled wilderness."

"Look, mister, I think you've got the wrong planet."

"But the folders *distinctly* mentioned a glorious life in the jungles!" He waved a gaudy pamphlet in the clerk's face.

"They mean the two square miles of jungle under the Dome," replied the youth. "A breathable atmosphere is maintained and all activities are safety-supervised. No hunting allowed."

"Great heaven, boy, do you mean to tell me that a raw, primitive jungle existence is impossible?"

"All I go by are the rules, mister. And the rules say that all tourists stay *under* the Dome."

"They's *one* man what ain't under no gawdam dome," rasped an ancient voice. "They's one feller out thar an' he damwell ain't safety-supervised!"

A wizened old Spacer with a face like a dry river bed stood near the desk. A ragged uniform hung from his withered stick body.

The clerk scowled and shook his head. "Don't pay no attention to old Cooney. Everyone know's he's space happy."

Phineas peered into the leathery lined face. "You mean that there's a human being living out there—in the bush?"

"Dang right I do!"

"He means the White God legend," growled the clerk. "Some crazy story they tell of a tall white God who lives in the heart of the jungle."

Cooney stamped his foot. "I tell-ya I *seed* him onct meself! Plain as day, he was. Seed him down in a clean stretch a ground, a clearin' it was, when I flew the Lucy Mae over. Breathin' easy as ya please—and without no space helmick neither!"

"Why, Tildy!" exclaimed Phineas, turning to his wife. "If this old fellow speaks the truth can't you see what this means? If I can capture him, bring him back to civilization, our fortunes will be made!"

"But our honeymoon . . ."

"We'll make it a two-in-one trip. A honeymoon and a hunting expedition."

"Waal, he's in thar right enough," spat the old Spacer. "An' fer grub an' keep an' drinkin' likker, I'll lead ya right ta that clearin' by dad!"

"Oh, Tildy, is this not the kind of adventure to stir a man's blood? A rough shoot, a ready quest." He turned to the clerk. "Now, boy, I'll need a safari and supplies."

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"Look, mister, it's forbidden in the rules. It would take Mr. Spearblock himself to change the rules and he—"

"Tut," said Phineas acidly. "Lead the way to this Spearblock. I'll state my case in the kind of plain language I'm sure he understands." Behind his cupped palm he whispered to Tildy. "Money talks, my dear, and we've your savings to speak for us!"

Planetary Affairs Chief R. W. Spearblock tipped far back in his swivel-chair and thoughtfully laid the orange length of a Ticonderoga Earth pencil along his richly veined nose. "A highly unusual request, Mr. Perchall. Most unusual indeed."

"Shall we say . . ." Phineas leaned forward, eyes slitted, "one thousand dollars for your services?"

"Ah," Mr. Spearblock placed a tiny scented mint on the pink ledge of his tongue and smiled. "A bargain, sir. Of course you must realize that I cannot assume any responsibility as to your safety. But you shall have your safari and supplies."

"But—what about the natives?" asked Tildy. "Will they like the idea of our tramping around in their jungle?"

Spearblock pressed a small button on his desk. "I have summoned Matoosh to act in your behalf. He is himself a native and only recently offered to aid us in native affairs. You'll find him capable and trustworthy, I'm sure."

A second later the door opened and the Venusian glided in. He was nine feet tall with a body like an elongated basketball, six green tentacles and a pair of sad eyes on stalks. He floated about a foot above the floor.

"Good afternoon, Matoosh."

"Afternoon, sir. I was reading when you buzzed."

"Something good?"

"Plato, sir."

"I'm sorry, Matoosh."

"Quite all right, sir. I marked my place."

After this friendly exchange Spearblock introduced the Perchalls. Matoosh bowed gravely to each of them; and Tildy was surprised to find that the alien was not actually repulsive to her. Odd, certainly, but not repulsive.

"I hope you'll make it clear to your people that we mean them no harm," said Phineas.

"Of course, sir."

"Your safari will be ready to leave at sunrise tomorrow," Spearblock told them. "Matoosh will accompany you to your destination!"

Matoosh bowed once more to each of them, and glided out of the room.

At least he's very polite, thought Tildy, watching the door close behind him.

The safari set out at the precise crack of dawn. Matoosh, Phineas, Tildy and the old space rat, Cooney, took the lead, followed by a line of twenty Earth bearers, supplies carefully balanced on their shining space helmets.

Tildy had been given a case of

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Swanongi juice by Matoosh, who told her it would do marvels for her weight. The fact that she would be able to shed some excess poundage helped considerably to dispel much of the gloom originally associated with a safari of this type. She was even able to appreciate the lush alien beauty of the Venusian jungle.

During the night the rain had stopped and a hot, lemon-yellow sun swelled huge and heavy over the misted foliage. The jungle was a blaze of amazing colors and the webbed leaves sparkled and shone.

Tildy could hear the sweet early-morning song of birds; and the small furry animals that scampered out of her path reminded her of the pet squirrels she used to feed in her yard back home, with their plump tummies and toy-button eyes.

As the day wore on, however, the jungle began to steam under the high-riding sun. Gasping inside her helmet, Tildy staggered up to Matoosh at the noon halt.

"The jungle is like an oven," she complained. "The heat is awful."

"Might I then, madam, offer a simple suggestion?"

"Certainly."

The alien folded four of his tentacles behind his back. "I suggest the immediate removal of that which you term a girdle."

Tildy flushed angrily. "I ought to slap your face!"

"I have no face," Matoosh said truthfully.

"How dare you suggest such a—a *personal* thing!"

"The incredible garment is wholly unnecessary. It merely binds and constricts."

"I'd look a sight," Tildy said, attempting to smooth the lumpy ridge of girdle at her waist.

"In the jungle, comfort is a prime requisite. And I fail to see how one can be comfortable in an Earth girdle."

With that he bowed and ballooned gently away.

"Good Lord!" exclaimed Phineas on the second day's march. "How can you go along humming in this fantastic heat, Matilda?"

Tildy smiled shyly, eyes downcast. "I—I just got rid of things. I just don't think you should fight Venus. It's really rather *nice*."

Phineas trudged on in silence. With each step his heavy pack seemed to press him deeper into the soft ground.

"You're carrying too much," Tildy told him. "Why did you have to drag along that full set of Chadwick?"

Phineas halted, glaring at his wife. "Where, may I ask, would we be on a trip of this kind without Chadwick's THE ABORIGINAL AND WHAT MAKES HIM TICK? When we find this wild devil we'll have to deal with him intelligently. And that is where Chadwick shines! The man is an absolute genius when it comes to the savage mind."

"Well," said Tildy, "I do hope you're right."

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"My back is killing me," groaned Phineas on the third day. "I simply cannot voyage another mile."

"I feel wonderful," smiled Tildy. "I've lost three pounds a day since Matoosh gave me that wonderful *Swanongi* juice!"

"Yowth!" Phineas began hopping about on one foot.

"What's wrong now?"

"Thorn. Right in my big toe. *Damn* these thorn bushes!"

"You ought to watch where you step. I always watch where I'm walking."

She knelt beside him and helped him off with his boot. "Quit squirming," she demanded, "and I'll bandage it."

In the camp that evening Matoosh glided up to Phineas.

"The bearers, sir."

"What about them?"

"They are restive and fearful. I overheard their mutterings."

"What do they fear?" asked Phineas.

"The curse of the White God, sir. I'm very much afraid they are prone to dark imaginings."

"I'm not a well man, Matoosh, and I simply cannot concern myself with such idiotic business. Have old Cooney talk to them. Tell him to tell them, for Lord's sake, that everything is hunky dory."

"I shall do my best, sir." Matoosh faded quietly into the dark.

"I'm struck!" shouted Phineas on the morning of the fourth day. "My hand is paralyzed!"

"Let me see it," said Tildy. "Maybe you just scratched yourself."

"Allow me to know when I've been bitten," snapped Phineas. "One of these confounded Venusian pests sank a fang in my baby finger. Poisoned it, most likely."

"Well, you haven't been using the *Punogee* oil Matoosh gave us. No wonder things bite you. Now, calm down. Here's Matoosh."

"Relatively harmless, sir," declared the green Venusian, hovering professionally over the injured digit. "Your finger will swell, but by the week's end you'll feel no ill effects."

Tildy sighed and reached for the bandages.

That night in camp Phineas resembled a snowfall. In addition to the bandaged thumb and foot, he now carried his left arm in a sling.

"That arm looks nasty," Tildy commented, sipping a cup of hot cocoa in their pressurized tent.

Phineas emitted a half-sob and fell back on his pillow. "The bone is undoubtedly splintered beyond repair. I'll be maimed for life."

"You silly thing. You should have *seen* that animal trap. I did and missed it with no trouble. Have some cocoa candy?"

"Hell, no!" Phineas exploded. "Hell, no, I won't have some cocoa! I'll die of thirst out here. I'll leave my bones to rot in this stinking jungle!" He was on his feet, arms flailing the air.

"Oh, sit down, Phineas, before

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you fall down. Remember, all this was your idea. You were the one who wanted to live in the lap of the primitive, to brave the trackless wild, to pit your very strength against—"

"That's fine," Phineas cut in furiously. "Quote me. Fine! Throw the words in my face like old fish."

Phineas suddenly peered at his wife, a strange new light in his eyes. He slowly extended a questing hand and prodded Tildy's waist. "Matilda! You've taken off your girdle!"

"It was binding."

"And—" He poked gingerly at her upper anatomy. "I mean, you're not wearing a—"

"It constricted."

"Good Lord!"

"I just unbridled," said Tildy. "And I haven't felt this good in years. I have Matoosh to thank for it all. He's really a dear."

And picking up a copy of APE, FRUITFLY AND YOU, she retired to her cot.

At the end of the fifth day's march, Phineas caught his left foot in a *Swanongi* root and sprained his ankle. He hobbled into camp on makeshift crutches.

"Damn this rotten bush country!" he gasped, tears in his eyes. "It's absolutely destroying me. My battered carcass will soon be left for the—"

"Guess what, Phineas?" Tildy cut in. "I've lost more weight! At least nine pounds. Isn't it wonderful?"

"If the insects miss," Phineas continued, "if I survive the traps, the sun will get me. Bake me to the bone, cook me like a suckling pig. I'll be burned to an ash in this damned—"

"If I could lose three pounds a day for twenty-four days, then I'd only weigh 110!"

The pressure-flap hissed, and Matoosh glided into the tent. "Beg pardon, sir, but the bearers have, as you say on Earth, flown the coop."

Phineas blinked up at the alien. "Do you mean to tell me that the ungrateful wretches have bolted?"

"Evidently they measured their pay against their superstition and the latter won out. However, the venerable Mr. Cooney is still with us."

"How terrible!" exclaimed Tildy.

"Their action, I must admit, was not entirely without provocation." Matoosh paused, and his eyes lowered. "I am ashamed to report that some of my people entered camp earlier this evening and quite dismembered their leader before I could intervene."

"Great Scott! Then we're under attack!" roared Phineas.

Matoosh raised a calming tentacle. "No need for alarm, sir. I was quite firm in cautioning my people against future indiscretions. We may, I assure you, proceed in perfect safety."

"Thank you, Matoosh," Tildy smiled. "We're very lucky to have you with us."

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Before she went to sleep that night, Tildy wondered just why Matoosh took so much trouble to protect them. They were, in point of fact, trespassers. She had the feeling that a special reason existed to justify the alien's behavior, and that she, personally, was involved.

At noon, on the sixth day, old Cooney sighted the clearing. "By ginger!" he shouted, running ahead and pointing. "Thar it be! Thar's the clearin' jes like I said."

The matted jungle fell back to reveal a mile-wide stretch of lush, sun-bright grass, which rippled like a huge green flag under the fingering wind.

Phineas adjusted his eyes and made out a small, log-like structure at the far edge of the clearing. He swung triumphantly to his wife. "Didn't I tell you he existed? There's his primitive home. Crude and rough-hewn. The mark of the savage."

Tildy said nothing. She felt a strange excitement rising within her.

"Let me handle everything," Phineas said. "The proper approach must be made, the proper overtures of friendliness extended, just as Chadwick advises. I'll do the talking."

Matoosh drifted up to Tildy. "Mr. Perchall is very excited."

"Yes," she replied. "It's a big day for Phineas."

"It is a big day, certainly—but not for your husband."

"Why—what do you mean, Matoosh?" She tried to read an expression into the featureless balloon head.

Matoosh flicked a casual tentacle. "He is to return to Earth. You are to remain."

"You mean stay here, on Venus, without my husband?"

But Matoosh did not answer. He moved away, toward the cabin.

"HALT!" screamed Phineas, gesturing wildly. "*I'm* to make first contact. Halt, you protoplasmic blob!"

Matoosh continued. He reached the cabin airlock and waited. A hiss, a sigh of escaping air, and the door opened.

A blonde giant stood on the threshold.

Tildy gasped. The white savage was the handsomest man she had ever seen. He towered well over six feet and wore what seemed to be a type of fringed-buckskin suit. A small oxygen mask covered his lower jaw—thus dispelling the "helmetless God" legend. Under his curling gold hair, his blue eyes were deep and steady, his cheekbones high and finely molded. To Tildy, even his not-too-large not-too-small ears were marvelous to behold.

His appearance occasioned a moment of awed silence. Then Phineas rushed forward, his right hand out, palm up, in the Chadwick-inspired gesture of good will. "I bring greetings from Earth, the third planet," he said, "to you in the wilderness of Venus."

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The giant did not speak.

Phineas hesitated, then asked, "Can—you—speak—English?"

The tall savage did not move. He was looking beyond Phineas.

He was looking at Tildy.

An odd, delicious tingle needled through her; she felt as light as foam as she walked slowly up to the big stranger. "Hello," she said softly, "I'm Matilda Perchall."

"Hello, my dear," the tall man said in flawless English, his tone deep and gentle. "I've been waiting for you."

He turned majestically towards Phineas.

"Matoosh will accompany you and Mr. Cooney back to the Dome. Return at once to Earth and forget you ever saw this woman. She is now mine. And please do not question my orders. If you do, I have the power to *force* you to obey them. I hope, for your sake, that I will not have to use that power. Now, go."

Phineas paled, then recovered some of his initiative. "What do you mean you've been *waiting* for my wife? Why, this is all fantastic and preposterous! You can't possibly mean that I—"

"GO!" The giant's voice was stern and his rigid arm pointed into the jungle. As Matoosh glided forward to the slack-jawed Phineas, the big man swept Tildy into his arms.

The cabin airlock hissed, sliding open to receive them. He carried her over the threshold.

Slowly he lowered her to the floor and drew off her helmet. Then he removed his own lower face-mask.

Tildy goose-pimpled. "I am fat," she said, trembling.

"Here, with the help of *Swanongi* juice, you will soon become slim and beautiful."

"I am married to Phineas."

"He is a boob, an oaf. You never really loved him."

"But, I—"

"Matoosh arranged it all. He knows me better than I know myself. I needed a woman to complete my life, and so he brought you to me. He looked beyond your plump exterior, Matilda, and he knew that I would love you. And I do. I most assuredly do."

Tildy felt giddy; her heart was fluttering like a frantic bird. "I—I love you also!" she told him. "And your jacket photo certainly doesn't *begin* to do you justice."

Boliver Chadwick smiled modestly, flicking a bit of dust from his buckskin suit. "Jacket photos never do."

He lit a great briar with a wooden stick-match and puffed deeply, drawing the scented smoke into his lungs. "Now I have all the things I need. My work, solitude, an outdoor paradise, and a fine, fine woman." He seated himself on a low couch and patted one knee. "Come here, my dear one."

Tildy blushed, sighed, goose-pimpled—and moved toward the lap of the primitive.

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shapes in the sky

by . . . Civilian Saucer Intelligence

Twelve points of present-day knowledge about UFOS that were not anticipated by Fort, patron saint of Ufology . . .

"YEAR after year I am becoming nobler and nobler. If I can live to be decrepit enough, I shall be a saint," remarked Charles Fort in *Wild Talents,* published — posthumously, alas!—in 1932. In a sense, his quizzical prediction has come true since his death: without impropriety it may be said that "St. Charles" is venerated by UFOlogists as the patron of flying-saucer research. But "the world do move" (in spite of Fort's skepticism on that point), and if he were with us today, the 84-year-old patriarch would find much in the skies that would be new to him.

When we add the recent observations to Fort's own data, we find ourselves with a body of evidence of startling variety and volume; in fact, it turns out that we actually know a great deal more about UFOs — strange and baffling though they continue to be—than we might have realized.

The rockbound skeptic, who declares that nothing short of a UFO sitting in his own lap could qualify as "evidence," may now flounce out of the room. For those who consider that the hundreds of thousands of reports made by reliable witnesses

CSI, in their latest column, written specially for this magazine, continue to comment on the writings of Charles Fort, and on what has been learned since Fort's day. Civilian Saucer Intelligence of New York is a research group which holds occasional public meetings and publishes a newsletter.

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deserve to be given some weight, we offer the following catalogue of well-substantiated UFO characteristics that have been recognized *since Fort's time.*

Discoidal UFOs

Perhaps the most striking difference between Fort's UFO sightings and ours is that he so seldom mentions *disk-shaped* objects. He was familiar, of course, with the cigar-shaped type of craft; but today's common or garden "saucer," with its convex top or with symmetrical top and bottom bulges, hardly appears at all in his pages. Yet nowadays the disk, in one or more of its variations, greatly outnumbers the cigar shape; and these two types together account for most (though by no means for all) of the UFOs seen.

The convex lens with an edge around it, like two basins joined edge to edge, is one of the forms most frequently reported. It is clearly seen in the now-famous photograph taken January 16, 1958, at the lonely south Atlantic island of Trinidad; the picture's authenticity has been certified by Brazilian Navy officers who were present when it was taken. (It appeared in many newspapers and all saucer magazines last winter; Max Miller's *Saucers,* Spring 1958, had a particularly clear reproduction.) The UFOs of the Tremonton, Utah, movie of July 2, 1952 were compared by their photographer, Delbert Newhouse, to "two pie pans, one inverted on top of the other" (Ruppelt, p. 292). The UFO that almost collided with RAF Flight Lt. Salandin's Meteor jet on October 14, 1954, "had a dome-shaped top and a similar round projection beneath" (Keyhoe, *F. S. Conspiracy,* p. 207). Examples could be multiplied. As for the type with the upper dome only (unfortunately associated since 1953 with the false claims and spurious photographs of George Adamski), its prevalence is well recognized: three of the twelve "selected cases" of Project Blue Book's Report #14 depict such objects, while two other sketches show coin-like disks, and one shows a lenticular type.

High-Velocity UFOs

The important fact that UFOs are capable of speeds of thousands of miles an hour would undoubtedly have come as a surprise to the founder of UFOlogy. To be sure, Fort recognized the possibility that "there may be swifts of the sky that can board planets," but the speeds required seemed to him implausibly great. He thought it more likely that the earth was not really moving through space as fast as the astronomers said it was—if at all. But it now turns out, on the basis of innumerable reports both visual and radar, that the UFOs *are* indeed "swifts of the sky," and *do* command the velocities needed to board and leave planets—velocities which, now that we have begun to work with them ourselves, no longer seem so extravagant.

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The highest UFO velocity yet measured was about 18,000 miles per hour, which is "circular velocity"—the speed at which a Sputnik or a Vanguard satellite whips around the earth. The observation is a famous one. On April 24, 1949, at Arrey, New Mexico, a Navy crew was making weather observations preparatory to launching a Skyhook. A fast-moving, white elliptical object crossed the path of their weather balloon and was followed by aerologist Charles B. Moore, Jr., with a 25-power theodolite telescope, and by the other four crew members with the naked eye, as it moved across the clear morning sky. After 55 seconds it suddenly shot upwards, and disappeared a few seconds later in a vertical climb. Commander R. B. McLaughlin, in charge of the unit, stated in *True* (March 1950) that the object was judged to be at a height of 56 miles, and consequently must have been 100 feet long and traveling at a speed of 5 mps. The observation was also described by Ruppelt (pp. 100-101), who gives the computed speed as 7 mps; details are given by balloon expert J. Gordon Vaeth in his book, *200 Miles Up* (Ronald Press, 1951, pp. 113-116).

Of course, the speed computed for this object depends on the correctness of the estimate of its distance, which we understand was determined only by an "aerial-perspective" method. Fortunately, radar can give us unequivocal data on UFO velocities.

Radar Observations

Obviously, Fort has no radar sightings of UFOs, for this type of observation came in with the development of microwave radar in 1944. There are two types of radar sightings: the curious "radar angels" (see FU, Feb. and Mar. 1958), when blips are tracked on the scope but nothing can be seen in the sky; and the combined radar-visual sightings, which constitute some of the strongest cases on record. (A third related type exists, when the object seen visually cannot be picked up by radar apparatus nearby.)

The highest velocity known to have been recorded by radar was 2.5 mps, in the spectacular Gulf of Mexico case (FU, Feb. 1958); while this may be considered slow compared to the Arrey object, it is still in the space-travel range of magnitude.

And not only the high velocities, but several other important characteristics of the modern UFO have been recorded by the greenish blips on the radarscope; for example, the next item.

Inertialess Maneuvers

UFOs nowadays are famous for their breathtakingly sharp high-speed turns and angular maneuvers, which seem to flaunt to the observer the fact that they have learned how to nullify the inertia that we think of as one of the most inviolable properties of matter. These darting maneuvers — frequently observed on

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radar—are characteristic, incomprehensible, and awe-inspiring.

It seems that the first definite observation of this kind of behavior was made on the evening of June 28, 1947, by four Air Force officers, two pilots, and two AF intelligence officers at Maxwell AFB in Montgomery, Alabama. They saw a bright light near the horizon approach them along a zigzag path, with bursts of high speed; when it was directly overhead, it made a sharp 90-degree turn and shot off to the south out of sight (Ruppelt, p. 36).

Since then hundreds of observers, many of them seasoned pilots, have reported this same extraordinary kind of performance. Of all these cases, the sensational Nash-Fortenberry sighting of July 14, 1952, over Chesapeake Bay still holds top rank: these two experienced commercial pilots saw six huge glowing red objects, approaching at a fantastic speed—later estimated *conservatively* as 6,000 miles per hour—perform a "completely amazing" change of direction; without any arc or swerve at all, acutely and abruptly—like "a ball ricocheting off a wall"—the objects *altered course by 150 degrees.* (*True,* October 1952).

The characteristic angular maneuvers of a UFO have at least once been captured on movie film. The sequence was taken on August 23, 1953, in Port Moresby, New Guinea, by Mr. T. C. Drury, Deputy Director of Civil Aviation for New Guinea. It shows a cloud (a newly-formed cloud, according to Mr. Drury) in a blue sky, out of which there issues horizontally a small white ellipse with a tadpole-like tail. This object rises abruptly, losing its tail, for a distance of about eight of its diameters; then immediately resumes its horizontal course at the original speed, again developing a tail. The original film is still in the possession of the Australian government, but a careful sketch of it, by Andrew Tomas of the UFO Investigation Centre (Sydney, Australia), is reproduced in that organization's *UFO Bulletin* for March 1958.

Orthotenic Lines of Travel

In perverse contrast to these sharp-angle turns is another facet of UFO behavior, exhibited in western Europe in the fall of 1954 and described for the first time by Aimé Michel in his new book, *Flying Saucers and the Straight-Line Mystery*: their propensity to travel along straight lines as if following invisible railroad tracks in the sky. We spoke of this "orthoteny" in a recent FU article (Aug. 1958); here we will only remind the reader of the strange pattern of absolutely straight lines that marked the location of sightings in France during that period.

These objects did change direction; but they did *not* do so with the dazzling abruptness of the maneuvers just described. Instead, the change involved a full stop in the air, then a descent with a motion repeatedly compared by observers to that of a falling leaf or of a coin

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sinking through water, and finally, re-ascent and departure in the new direction along another orthotenic line.

Oscillating Flight

Curiously enough, this "dead-leaf descent" described by Michel appears to represent, in the *vertical* plane, the same type of motion that has been observed many times in this country while a UFO is following a *horizontal* flight path: namely, an oscillation, flutter, or "wobble."

As everyone knows, the term "flying saucer" itself came from Kenneth Arnold's original description, not of the shape but of the *motion* of the objects he saw on June 24, 1947: "They had a flipping motion like saucers skipped over the water." There are a few reports of objects with this typical wobbling motion earlier than Arnold's sighting, but they are unverified. Judging by contemporary accounts, neither the spherical foo-fighters of 1944-45 (*American Legion Magazine,* Dec. 1945) nor the cylindrical (or square!) Swedish "ghost rockets" of 1946 performed in this singular fashion. And perhaps Fort's failure to note this oddity of UFO flight is connected with his lack of disk-shaped "saucers."

Sudden Disappearance

If the wobbling UFO is a commonplace, the vanishing UFO is a rarity; yet there have been such cases. We do not refer here to the "nocturnal meandering light" that seems to turn itself off and on while it moves erratically in the sky, but to disappearances in broad daylight. One such case was described in our first FU article (Mar. 1957); it is validated by the reputation and character of the observer. Perhaps some of the reports in which the observer merely states vaguely that the object "disappeared" refer to the same phenomenon.

Playfulness

One feature of modern UFO behavior would have delighted Fort: both curiosity and playfulness seem to be demonstrated by the round or disk-shaped type that now predominates. The foo-fighters over Germany and Japan liked to accompany airplanes (to the consternation of their pilots); and in most of the radar cases cited in our February and March articles, the UFOs tagged along with planes, changed course to look them over, or actually led them a sportive chase. In numerous cases a UFO has teased its jet pursuer by slowing down, then scooting off when the jet gets too close; on November 6, 1957, ground observers in Shawbridge, Quebec, and in Plattsburg, New York, watched this game being played in broad daylight—no question, here, of a deluded pilot trying to catch up with Venus! On July 4, 1957, a red-luminous disk with a cupola accompanied a Brazilian air-

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liner for almost an hour, part of the time literally *flying rings around the plane.* (*APRO Bulletin,* May 1958). That UFOs have likewise been seen to circle inquisitively around balloons and rising rockets is also well known (one rocket example is given by McLaughlin, *op. cit.*)

To Harry Barnes, air traffic controller over Washington in July, 1952, the UFOs he watched on radar acted "like a bunch of small kids out playing" (FU, Mar. 1958). And Navy Commander Walter Karig described their behavior graphically (*American Weekly,* Nov. 22, 1953): "UFO maneuvers make one think of the actions of half-grown puppies rather than the operation of spaceships. A group of the things will appear on radar, evidently going places like a puppy-pack across a meadow, and then break up. Some will loaf around, others dart hither and yon. A passenger plane bumbles into the field, and the nearest Flying Beagle will dart over like a brave pup going up to sniff at a cow, and then break away as if its curiosity was satisfied. But let the airplane, or some hastily summoned pets, try to get closer, and the UFO will go into reverse and scram out of there, with the whole pack streaking away —at 7000 miles an hour."

Ivan Sanderson (a zoologist, be it noted) has made a similar comparison: "The behavior of the objects can only be likened to that of animals. They dance; they play tag; they even appear to breed . . . they are highly inquisitive, but they try to keep out of harm's way" (FU, Aug. 1957).

It is true that they "dance"; the performance recorded by Delbert Newhouse is only one of many such displays that have been seen. We wish there were space to describe the "Folk dance" of three couples of sombrero-like UFOs, observed by at least 17 witnesses over Whittier, California, on August 22, 1957. Of course such behavior may not be as "playful" as it looks to us, but still it is hardly what one would expect of spaceships. Whatever it may mean, it appears to be a new phenomenon, not seen in the skies of the nineteenth century.

Angel Hair

Surprisingly, Fort apparently knew nothing of "angel hair," so familiar to present-day UFO students. He was well acquainted with the mysterious, massive autumnal falls of "gossamer" (which must surely be the same thing), and he was the first to point out the inadequacy of the conventional "spiderweb" explanation (*New Lands,* Chap. 38). But he cites not one instance in which this stuff was seen to fall from objects in the sky. Apparently, not until 1949 did anyone see "gossamer" dropped by UFOs; but since that date there have been dozens of cases, all in excellent agreement except for one point: the *volatility* of the "angel hair," which seems, strangely enough, to

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vary in different cases. Apparently this is also a new phenomenon.

Noiselessness

Many of Fort's UFOs were noisy; others were soundless. But in Fort's day it was not realized that many UFOs move so fast in our atmosphere that they have no "right" to be silent. The discovery of this paradox is wholly post-Fortean. The apparent impossibility of such high velocities without corresponding acoustic effects has been invoked by skeptics such as Willy Ley as an argument that what has been reported cannot be. But others of us feel that what has been repeatedly observed *must* be; if theory fails to predict the effect, so much the worse for the theory. The French Air Force officer Jean Plantier (*La Propulsion des Soucoupes Volantes,* Editions Mame, 1955) believes that the lack of shock-wave effects can be accounted for if the UFOs are propelled by a synthetic gravity field; but the suggestion is still a speculative one.

"Motor"-like sounds have been heard both in modern and in "classical" times (see our article of Nov. 1957); a somewhat high-pitched hum or whine when the UFO is close to the observer is often described, and the comparison to "a sewing machine" in Olavo Fonte's "Report from Brazil" (FU, Aug. 1958) is a very typical one.

Electromagnetic Effects

Another significant property of UFOs that went undiscovered by Fort because of the early date of his sightings was the *electromagnetic effects* that they sometimes produce. There can no longer be any doubt that these "hallucinated-machine" cases are real (see FU, June). They occurred repeatedly in Europe in 1954 (see Michel's new book previously cited)—stalled cars and trucks, headlights extinguished; and they were precisely duplicated three years later in the Levelland, Texas, area on November 2-3, 1957. But would-be hoaxers at Levelland could hardly have been imitating the European reports, which at that time had never been published in this country.

Particularly noteworthy among the European reports was one from Forli, Italy, late in October 1954: a red-luminous object flew over two tractors rolling side by side along a road, and killed the engine of one of them. The other, which was unaffected, had a diesel engine—which uses no electricity.

On January 30, 1958, at 11:45 p.m., a lawyer, Dr. José Valencia Dongo, was driving on the Pan-American Highway in Peru, 220 miles north of Arequipa. Suddenly the headlights went out and the engine died; Dr. Dongo pulled off the road. Then he and his two passengers saw an "incandescent" object shaped "like a flying saucer" descending from the cloudy sky. At a height of 150 feet it hovered motionless for eight minutes; then disappeared into the clouds. A truck

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and a bus were also stopped; Dr. Dongo said that the occupants of all three vehicles felt a "nervous shock" before the UFO was seen. (UP dispatch, Feb. 1 in *La Prensa*, N.Y.C.)

The really incredible feature of such reports is the extinguishing of the headlights. Interference with radio seems natural, and with car ignition not impossible, but it is hard to accept that any kind of field or radiation could interfere at a distance with something so simple as the flow of direct current from a storage battery. But the accounts are clear: this does happen.

A quite different electromagnetic effect was observed for the first time on April 14, 1957, at Vins in France. An object shaped like an ice cream cone, with many little "metallic" rods projecting from its under-surface and in rapid vibration, landed twice, near two metal roadsigns in succession, which were both set into violent motion, with a deafening noise. The object then flew off, "pitching from side to side." When Jimmy Guieu, French UFOlogist, investigated three days later, he found that both of the roadsigns were magnetized, while similar ones in the neighborhood were not. (From *Ouranos*, French UFO magazine, #21, where the case is recounted in detail.)

Physiological Effects

In modern times many people have claimed to have experienced unpleasant bodily sensations in the presence of a UFO: noxious odors or fumes (see FU, Jan. 1958), "burns" inflicted by saucers (July 1958), visceral pains, headaches, itching, a sensation like electric shock, and total paralysis. We can vouch for the veracity of only a few of these tales, but so much testimony is hard to dismiss. The "shock" and paralysis were characteristic of the great European wave of 1954; they have apparently never been reported in this country, yet the details turn up again in Dr. Dongo's Peruvian experience.

To judge by Fort's books, stories of this kind were not told in the nineteenth century. Anyone as canny as Fort, however, would be inclined to view with great suspicion any claim of bodily suffering caused by a strange experience; like telepathic communication, this seems like the sort of egocentric feature that might well be included in an invented tale. Examination of Fort's original notes might perhaps show that he did come across some such stories, but omitted them from his books in the belief that they were unlikely to be true.

We have listed twelve points of present-day "knowledge" about UFOs that were *not* anticipated by Charles Fort. (A thirteenth might be added, based on the sparse evidence for radioactivity sometimes produced by UFOs. But the strange fact is that even in this era of fallout and the Geiger counter, prac-

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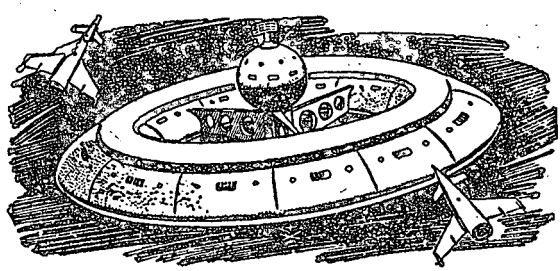
tically nothing has been done to assemble such evidence.) Of course any such list is to a considerable extent a matter of opinion, but we believe that these twelve points would find fairly general acceptance—subject to variations of individual emphasis and interpretation — among experienced and critical-minded UFOlogists.

Both as to quality and quantity, during the past decade we have accumulated far more evidence than Fort found in a lifetime of research, and the total is impressive. But even today no serious UFOlogist would, in our opinion, claim that we have any indubitable "hardware" from flying saucers, or that we have gained any real information about their place of origin, their motives in coming here, or their reasons for behaving as they do.

Thus, although we have learned so much since Fort's day, we still have hardly scratched the problems that we set out originally to solve. Our data are much more abundant and varied than Fort's; but our speculations are essentially the same as his. The things we still lack—authentic "hardware" and authentic "contact"—are unfortunately the things that are most important.

Nevertheless, if our ideas have any truth in them at all—and if the UFOs oblige us by continuing to appear—some day we will have both of these things. On that day our "preposterous" UFOlogy will be established as a science—and on that day, too, as Charles Fort predicted, "flying saucers" will make the inevitable transition from the outrageous to the commonplace.



SIX MINUTES IN SPACE?

An army plan to rocket a man into space, keep him there for six minutes, and then return him safely to earth was disclosed recently, confirming the impression that the problem of missile reentry into the atmosphere had been licked and, as a matter of fact, been found somewhat exaggerated. The Army apparently proposed to use a Redstone missile—presumably redesigning its warhead section to hold a man. It was held possible that a multiple system of parachutes could be attached to create drag upon the warhead section as it reentered the earth's thicker atmosphere, thus permitting a man to land safely.

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universe in books

by . . . Hans Stefan Santesson

Comments on the new books —anthologies and novels— and other works which may conceivably interest you.

JUDITH MERRIL'S latest anthology—SF—THE YEAR'S GREATEST (Dell, 35 cents) deserves commenting on if not only for the mixed reactions one has when reading this third and perhaps most interesting grouping of what the anthologist has regarded as the year's best stories. To completely accept this evaluation is to keep in mind the state of the field itself, and the state of mind of those writers who—only a few years ago—were perhaps writing richly imaginative and challenging material, and are today faced by certain realities. There was a good deal of discussion of these realities and this state of the field at the recent conference in Milford, Pa., co-chaired by Judith Merril and Damon Knight (author of last month's lead novel, BE MY GUEST). The comparative healthiness of the field, speaking economically, was brought out—a healthiness despite declining markets—but what was noticeable to this writer and what is, to a certain degree noticeable in this anthology, was the absence of an old fashioned word that at one time writers in the field would not have shrunk from—and that word is *dedication.*

Another report on some books of interest to SF and fantasy readers, and comments on the apparent thinking of some of these writers, each book—even including the one by C. G. Jung, the Swiss psychoanalyst, reflecting the many-sided aspects of life and speculative thought in these days.

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Make no mistake. I am not suggesting, as a noted science fiction writer did, several years ago, at the 1951 World Science Fiction Convention in New Orleans, that Science Fiction is—"a way of life." There speaks the eternal enthusiast, the man who perhaps has certain technical skills but has never grown away from the hopeful feeling that in science fiction he can find an escape from the realities of the world around him.

Extremes of this are the people who have a perfectly delightful time carrying on cross-country fandom vendettas, completely oblivious in the meantime of the larger world about them. And there are the others (I am thinking of one woman I met at that same New Orleans Convention) who come to Science Fiction hoping that somehow—someway—the field will have within itself the essence of that something that will soothe their own fears and complexes, that will reconcile them with the world in which they must necessarily move, and, in passing, they will attain a stature—albeit in a limited circle—denied to them up to that time.

But what has all this to do with Judith Merril's third anthology?

A good deal.

This appears to have been a year, to judge from the writing in this anthology and from other indications—including the tone of the discussion at Milford—where some failed to keep in mind this undoubted influence they have on the thinking of their readers. These are all skilfully told and smoothly written stories in this anthology, but there is something lacking—that intangible spark of almost dedication that was so visible at the first conference at Milford, for instance—the impulse to write something like, for instance, CANTICLE FOR LEIBOWITZ, that may not have been a perfect story but had an emotional impact on the reader impossible to describe.

To some extent our own uncertainties—our own insecurity—may contribute to this technical-perfection — but — absence — of — dedication so obvious in some of these stories. As Judith Merril points out, in her introduction,—"Someone was always looking at the stars. Now it appears the stars may shortly have their chance to look at us."

The man in the street has suddenly become aware of these same stars and of the possibility that in our time, or in our children's time, we may yet reach the stars. To a large degree this is still w-o-r-d-s to the average man, not in daily or constant touch with the researches that are making an imminent reality of these dreams found only in science fiction magazines a few years ago. But there is a danger in this, a danger which I believe has been repeatedly pointed out by John Campbell, and that is that we who work professionally in the field may allow ourselves to sit back, emetionally exhausted at the coincidental

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reality that history *has* caught up with science fiction.

This is of course nonsense. We must now recognize, as Campbell has pointed out, the new frontiers that the realization of these earlier dreams—these earlier hopes—imposes on us. As Anthony Boucher writes, in Judith Merril's anthology, so much more ably than I could,—"The science of tomorrow or the day after will, unquestionably, outrun the science fiction of today, just as today's science rapidly outran Poe and much of Gernsback. Conceivably, even time travel and speeds faster than light will, as science advances, turn out not to be fantasies after all. But as creative, imaginative minds keep thinking ahead to the step beyond the next, it is exceedingly unlikely that tomorrow's science will outrun the science fiction of tomorrow. What prophet can dare to prophesy the utterance of a prophet yet to come?"

As Judith Merril points out, in her introduction, "the interest of the better s-f writers has shifted steadily since the war years toward the field of human behavior. You will find rocket ships and alien planets in these pages, as well as robots, mutated monsters" (!) "and strange inventions; but the *science* under examination here is not primarily physics or chemistry. It is biology, psychology, anthropology, sociology, politics, economics—people."

In other words—it is science fiction!

By all means read Judith Merril's extremely interesting third anthology, S-F: THE YEAR'S GREATEST!

Let us now turn to a familiar subject in these pages—though it must be conceded that we do not explore the more piquant possibilities of the subject as fully, or as devotedly, as some of our contemporaries. We have been publishing material on the subject of UFO's, or "Flying Saucers" from time to time, because of popular interest in the subject and because of our conviction that there is a curiosity about the world around and beyond us among the readers in this field which is somewhat lacking among others that we can think of . . . If Science Fiction has "matured," as is so often said, it has done so because of this self-same intellectual curiosity, this refusal on the part of the reader and writer alike to discipline their imagination. And here we have this subject of Ufology—which admittedly has attracted a lot of expatriates from cloud cuckoo land *and* from the outer fringes of do-it-yourself as opposed to disciplined metaphysics. This has tended to obscure the fact that there are people working in the field (such as our friends in the Research Section of Civilian Saucer Intelligence) who do not have that familiar gleam in their eye that distinguishes the accepter of the difficult-to-believe from those less credulous . . .

And now we have C. G. Jung.

I would ordinarily not discuss

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a foreign publication in these pages, but I think those of you who read German will find Jung's new book —EIN MODERNER MYTHUS. VON DINGEN, DIE AM HIMMEL GESEHEN WERDEN (*1958*, Rascher Verlag, Zurich)—extremely interesting. The noted phychoanalyst, who, I might add in parentheses, has never hesitated to take a controversial stand on various matters (I am thinking of a controversy on this subject that sprang up in the letter columns of the *New Statesman*, some months back), has, it appears, been interested in the subject for UFOs throughout the past decade.

They began in Sweden, he writes, in the form of projectiles observed towards the end of the War (*the German V-7?*) and which it was assumed came from Russia. Then one saw in Germany the lights—the strange lights—which accompanied the allied bombing raids, and then began the reports of flying saucers seen in America and eventually all over the world, caught on radar screens at times, and by now seen by thousands.

While Jung concedes the possibility that there may be parapsychological explanations for some sightings, he is apparently inclined to think that some may be manned vehicles and some—some may be animate things from some unknown area in space.

There are, as is known, three psychoanalytical schools—that of Freud with its emphasis on sex motivations, that of Adler, and that of Jung with its emphasis (in the thirties as much as recently) on religion or faith and on myth-evocative fantasy. The important thing for Jung is not so much the reality or quasi-reality of these sightings (which after all date back to the Middle Ages—in fact to Biblical times); the important thing is what the mass fantasy has done with these happenings and the motivation behind these reactions. We live, writes Jung, in times when world concern over the Russian policy, the H-bomb, and the over-population of the Earth, has created certain reactions. Modern man has every reason to feel uneasy. He may think out the reasons for this uneasiness, and he may—as happened in the Renaissance and has happened throughout history—he may see things in the sky. Four hundred years ago these signs in the sky would have been assumed to have been caused by God. Today—partly under the influence of the age in which we live—there is speculation that those responsible may be the people on Mars, on Venus, or for that matter on Clarion . . .

This is an interesting book. There may be a tendency to quarrel with some of the conclusions that Jung arrives at, but you should make every effort to get hold of the book. If a translation does appear, that will make it all somewhat simpler, of course, though the average trade publisher may hesitate to explore the psychology of Ufology.

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Frederick Pohl and Jack Williamson explore, in UNDERSEA CITY (Gnome Press, Hicksville, N.Y., $2.75) a subject of increasing interest to the field—the very real possibility that, in time, world economics may demand the exploitation of the resources of the sea itself—and of the bottom of the sea. Strange worlds under the Sea will obviously, then, come into being—domed undersea cities, originally trading centers but eventually fantastically complex colonies—the control of which will make men rich, and the destruction of which may make some men richer. The present novel, the second in the series written by the two authors about the adventures of Cadet Jim Eden of the Sub-Sea Academy, is aimed at younger readers—but *can* be read by all ages without appreciable loss of dignity!

Robert A. Heinlein's METHUSELAH'S CHILDREN (Gnome Press, $3.00), is another chapter in that history of the Future which Heinlein has written—has constructed—with such admirable effectiveness. In the world of 2125, there is a group of people on Earth who, as a result of scientific breeding—the marriage of people who carry within their genes an intangible element X—live considerably longer than average man. There is no drug and there is no laboratory process involved, but their shorter-lived countrymen will not believe this. The result is that a dramatic step must be taken by these families, under the leadership of Lazarus Long, a "combination of an Abraham Lincoln and a Machiavelli." What then happens is characteristic fast-moving Heinleiniana!

Ivan T. Sanderson's MAN-MADE UFO, which appeared in last month's *FU,* was discussed Friday evening, July 4, on Long John's "Party Line," over Radio Station W.O.R., by a panel which included Sanderson and Lester del Rey, and also Vyacheslav Zawalischin, authority on Russian Science Fiction and author of the forthcoming EARLY SOVIET WRITERS (Praeger, $8.75); Sven Ahman, U.N. correspondent of the Stockholm *Dagens Nyheter;* and this writer. Ben Gross, columnist for the N. Y. *Daily News,* devoted a column to the broadcast a few days later.

A Chicago Committee, *Science Thru Science Fiction,* has started an interesting campaign for the establishing of Science Fiction Clubs in every elementary school, high school and college, a major aim of the club being that each reader get another person interested in reading in this field. The importance of SF as a way of encouraging interest in science is stressed by the committee (Fritz Leiber, Earl Kemp, F. L. Light) which is prepared to furnish programming suggestions to teachers and students interested in starting such a club, and also

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aid in diversifying the interests of members. If you are interested in starting a Science Fiction Club in your school, write to SCIENCE THRU SCIENCE-FICTION, Box 9148, Chicago 90, Illinois.

Finally—I hope you are planning to attend the 16th World Science Fiction Convention in Los Angeles this Labor Day Weekend! The SOLACON will be held at the Alexandria Hotel, 5th and Spring Streets, August 29 through September 1, 1958.

Membership in the SOLACON is One Dollar, and entitles you to the publications of the Conference including the proposed directory of members. Send your dollar to Rick Sneary, Treasurer, SOLACON, 2962 Santa Ana Street, South Gate, Calif. Plan to attend if you can!

These annual conferences represent a unique opportunity for those interested in this field to meet and exchange views on the state of Science Fiction.

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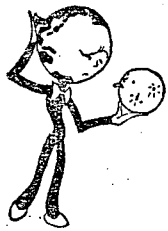

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flying saucer of the seas

by . . . Stephen Bond

Details about a Flying Saucer that will NOT be piloted by golden-haired Venusians — or Martians.

TRY to visualize a huge ship, looking like a kind of low-flying saucer, about nine hundred feet in diameter.

The ship will be round, a relatively thin disc, weighing 40,000 tons, and will be lifted about eight feet off the water on an air cushion propelled at a hundred and fifty miles per hour by air-screws mounted on deck and steered by air-fins like a plane.

A dream?

No—this is the air cushion ship that engineers in both England and Switzerland, Christopher Cockerill in England and Carl Weiland in Switzerland, are racing to make a reality.

A naval research man attached to the American Embassy in London is quoted as telling Weiland, "As far as I can judge, your theory is correct and practicable." Professor Jacob Ackeret, authority on aerodynamics and head of the Aero-Dynamic Faculty of the Swiss Federal Institute of Technology, has endorsed Weiland's work, warning him, however, that while the principle is feasible, elaborate and extremely expensive tests will have to be made before it can be certain

We have been accused of undue interest in UFOs, a subject on which we are, however, considerably sedater than some contemporaries. But here is a report, based on material appearing in the European press, on a very different kind of Flying Saucer — one that you may yet ride on. . . .

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that the whole idea is an economically sound proposition.

As Weiland points out, a slow moving ship is the most economical form of transport, but its resistance to movement increases disastrously at higher speeds, which there has been no progress—comparable to that in aviation—in designing faster ships. Weiland apparently realized, quite early, that the problem of high speed travel could be solved economically only by severing contacts between the vessel and the water—the ship would have to float on air. If the ship was raised out of the water, it could be propelled through the air at high speed, using a relatively small force.

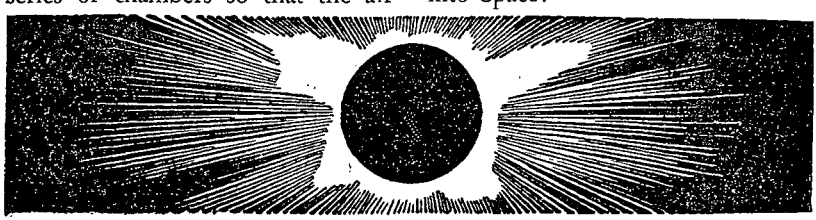
The immediate technical problem is to make the air cushion as efficient as possible by reducing the escape of air from the cushion to a minimum. The entire flat bottom of the air cushion ship is the bearing surface, and the air can escape only around the circumference. The higher the pressure, the more rapidly does the air—forced down by fans near the center of the circle—rush towards the circumference to escape. Using the labyrinth system familiar to designers of gas turbines, the pressure is reduced in a series of chambers so that the air supply in the cushion remains operative for a longer period.

The ideal ship will be three hundred yards across. Using this as a basis for calculation, Weiland's air cushion system can lift and support up to 2,000 yards a square yard of bearing surface. Power requirements work out at less than 3 h.p. a ton for the cushion, with an equal propulsion force (air screws) for a cruising speed of 150 miles per hour.

"The air cushion ship," Weiland points out, "can rise out of the sea, ascend a gently sloping ramp, and have its harbor on the ground. There would be no need to dig the Suez or the Panama Canals today. A wide runway would do."

The air cushion vessel will be a cross between a passenger liner and a plane, combining the best features of both—safety and speed. Atlantic crossings will take roughly a day and a half; more passengers and freight can be carried; and fares will be halved, as passengers' food supplies, fuel consumption and running costs are cut.

Incredible? Who is to say what *is* incredible in these days of constant change, when in our time we have already come so close to penetrating into Space?



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companion

by . . . John Ashton

It took the combined power of the ship and the portable force screens, flames crackling, to pass through.

THERE was nothing on Halcyon IV either.

For the past sixty years we had been pushing outwards into space. First the neighbouring planets. Then, as astrotravel developed, beyond them into the galaxy. The first colonies had been set up on two of the inner planets that circled our sun, experimentally rather than as a lasting achievement.

The interstellar drive brought us what we had always been looking for: a means to explore the unknown reaches far beyond the confines of our own solar system, far beyond our own galaxy. From reports now filed away at international space HQ back home some 9423 stars and asteroids, 356 planets and innumerable moons and larger satellite bodies drifting through space on erratic orbits had been visited.

Actually only six of the planets had been considered worthy of colonization.

And now, with the stardrive, at speeds exceeding that of light, we had reached the farthest limit of our possibilities. Halcyon IV was the end of the line. Either we turned back here and could reach

John Ashton, former correspondent for a number of American newspapers, now heads a small public relations firm in Brussels, Belgium. While he has contributed short stories to various British magazines, this report on the expedition to Halcyon IV represents his debut with American SF.

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home, or we never returned any more.

Of course, we all knew what we were really looking for. As all those waiting so eagerly for our reports on our native planet we were filled with the same longing, the same impetuous but immortal curiosity that had raised us from the level of primitive but intelligent beings to conquerors of the last great unexplored area on our maps—the universe.

This was our great adventure. It was so simple, so ridiculously sentimental and romantic in essence that, half ashamed, none of us ever voiced the goal that called us on and on.

We were looking for life!

Life in any form, shape or manifestation so long as it could be considered intelligent. Whether higher or lower than our own was of no importance. What we had now been seeking, for over fifty years and since the first excitement had died down, was a race that might eventually become a companion in space. Even the fact that it might be hostile was of little importance. Hostility was a psychological expression that could be broken down and transformed by persuasion, diplomacy and understanding. What really counted would be the knowledge that we were not alone.

So far, on all those worlds visited there had been nothing. Here and there a few crumbling ruins that bore witness to the long-gone presence of intelligence. Here and there also some plant life, certain highly developed forms but without creative or even active intelligence. No, we were alone in space and slowly but surely the dreams of a mighty star empire, built with the help of other races, was fading. The stars were ours—and they didn't mean a thing any longer. Better to remain at home, amongst our own people, than to continue wandering about space with hope vanishing and loneliness becoming more pronounced with every world visited.

And so we had reached Halcyon IV. It was the last frontier we could make, even with the unique equipment of our ship.

Halcyon IV—a pinprick of light we had discovered about six months ago. Here we would turn back. We could not risk our homecoming by going beyond it. And if we found nothing our dreams about the stars were doomed. All would be futile, and none would go beyond the inner planets of our own system any more.

And now, at last, we had arrived. Halcyon IV was the third of nine planets orbiting around a sun much smaller than our own. Coming in through the troposphere we found strong evidence on a developed flora on our instruments. There was air too, rich and a trifle heady, but perfectly breathable. There was water, for we passed over vast oceans on our way in. There were a few forests and what looked like

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fields, and huge black scarred surfaces, some of them strangely vitrified, others radioactive, and grey mountains. But not a trace of life showed up on our instruments.

We circled the planet five times before the Captain selected a landing site in the more temperate zone between the equator and the pole. There was not a sign, not even a ruin. Nothing! This world was empty, deserted of life.

The final landing place was at the mouth of a narrow valley, protected by a range of mountains some twelve miles away. Climbing out of the ship, carefully, guns at the ready, we suddenly noticed one thing. The silence. A tangible, overpowering silence that clung to the landscape, bore down and gripped the heart with skeleton fingers, numbed the brain. A silence that could mean but one thing; that Halcyon IV had been dead a long long time.

Although none said so we all; captain, twelve scientists and the twenty odd picked technicians that made up the crew, knew that this was the end of our ambitions. Nevertheless, more from a sense of routine than actual interest, we carried on with our operational instructions.

The two scouts we had aboard took to the air while we settled down to wait. Except for the botanist and the geologist there was nothing else we others could do. The two scientists moved disconsolately around the landing site and drifted back to the ship from time to time with a few samples of the flora and soil. You could tell their heart wasn't in the job.

By the time night fell—we already knew that a day on Halcyon IV was the equivalent of our twenty-four hours—the two scout vessels were still abroad. We sent out a linking beam over the radio and continued to wait, listening to the silence that seemed to crowd in on us. Only the scanners remained on the alert, probing the night around us, but the alarms remained silent.

All in all, we'd got used to it by now. When you've visited almost a hundred worlds, some inhabitable, most not, you get used to all kinds of silences and feelings of emptiness. You just couldn't care less, in the end—and that's what we'd come to. The end; the last milestone on the long journey looking for someone or something to share the frightening vastness you had conquered.

Somewhere around ten o'clock it happened.

Not much—not enough to set us wide awake. Up in the ship, radio had made contact with one of the scout boats. And the news that was coming in seemed sufficient for the Captain to take over. The others, scientists and crew, clustered together around the door to the radio cabin and down the passage.

"This is Charlie Two calling XB-7," the radio was muttering through a sudden windfall of stat-

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ic. "Can you hear me, XB-7? Over—"

"We hear you, Charlie Two," the Captain's strained voice rasped down the mike. "Come in Charlie Two!"

"Tren has seen something XB-7. It's a sort of light, reddish, like a beacon, on and off."

The Captain was pale under his tan. All of us probably, hanging on to every word. Was this what we'd been looking for? Our thoughts went out to the lonely little scout ship with its crew of three, circling over a pin-point of light somewhere in the darkness of that mountain range behind us.

"We're moving in to investigate," the tinny, impersonal voice continued in the loudspeaker. "We're putting the ship down three hundred feet from the light. Yes, it's red all right. We've taken pictures and are getting out sound and radiation equipment."

For about ten minutes—they looked like all eternity to me and probably to the others also—we waited again. The Captain and Tcher, the physicist, were breathing heavily. The others just stood around, staring up at the loudspeaker.

Then the voice was back.

"Charlie Two to XB-7. Tren speaking, sir. The light is stationary, fixed to a small pylon about three feet high. Molecular structure of metal unidentified, strong radiation. But we can't get near enough to touch it. There seems to be a sort of force field around the thing, two yards in diameter. And it's too dark to do much just now."

The Captain's voice cut in.

"Did you get any sound, Tren?"

"Yes, sir. We've recorded some in the ultra-short. It looks like a signal to me, the same code repeating itself every thirty seconds, coinciding with the flash of the light."

"All right, Tren. Get a fix on it and come back!"

The other's voice hesitated. "We'd still like to—"

"Come back, I said," the Captain roared. "That's an order. We don't know what it is. We'll see what the instruments say. Back, Charlie Two!"

"Very well, sir," Tren replied.

The scout was back a quarter of an hour later. Tren and his two companions remained closeted with the Captain and the senior physicist until the early hours of the dawn. Finally they called me in, together with Ran, the sound analyst.

"Make anything of it?" the Captain asked after he had played the recording three or four times.

"No," said Ran.

"Nothing at all," I said.

"You're a historian," the Captain pointed an accusing finger at me. "Look," and he slipped a three dimensional infra-red negative into the viewer. "Look, the pylon is of some metal we don't know, but it's impervious to radiation. What type

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of culture would you assess such a thing to?"

I stared at the picture for a second. "Highly developed mechanical," I said. "And there's something to the left of it, on the ground. A slab of something."

"I know," Tren put in. "I saw it on the spot. It looks like a trapdoor, but I can't be sure. We didn't have any special equipment with us, not even video, remember?"

"Well, we'll take the ship over in an hour or so," the Captain said. "We'll get through even if we have to blast a way through to the pylon."

I looked again at that picture and turned on the recording, slowing it down. The sounds grew more spaced. A mad chatter of some kind, totally incomprehensible. And yet I looked at Tren and the Captain and saw them watching me. Yes, there could be no doubt about it. They felt it too! There was something strange here, definitely strange.

A couple of hours later we were on the spot. The Captain set down the ship a bare fifty feet from the pylon. The strange object continued to emit its thirty second red flash.

The first team with whom I went in, approaching the pylon gingerly, clad in radiation suits and protected by our own force screens, got no farther than Tren had.

"Turn on the ship's field and increase the power slowly," the physicist suggested.

The nose of the ship glowed faintly as the field formed and expanded. Once more our four research teams moved in. At the rim of the pylon's field we were again forced back.

"Step up the power!" the Captain shouted into his portable mike.

"Amazing!" the physicist said. "Extraordinarily high up the nucleonic level. If this goes on the ship's power won't even be enough to cancel out that effect."

"We'd better get in," someone said grimly.

And we got in. It took the combined power of the ship and of the portable force screens, crackling with blue flame, to pass through the barrier.

"We can keep up this power for one hour, no longer," one of the technicians warned.

"Then we'd better hurry," the Captain said.

While our metallurgical and chemical experts studied the pylon, trying, without success, to cut away a sample, the Captain, Tren, the senior physicist and I stood over the slab.

"It's only stone," Tren said.

"Yes, but fashioned by intelligence, without a doubt," the Captain replied. As though the existence of the pylon did not confirm the fact without any words. "All right, we'll pry it up."

"Just a moment, Captain," the physicist moved a radiation counter over the slab, then a detector—slowly, ever so carefully. Finally he straightened. "It's clean," he said.

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A crowbar was passed on to us. We adjusted it to a small aperture we found at one end and Tren and I put our weight on it. Surprisingly enough, the slab came up without difficulty.

Underneath lay a flight of narrow steps, leading into darkness.

The Captain stepped forward, torch in one hand, blaster in the other.

Again, I had that strange feeling.

"Wait, Captain, there may be danger—we'd better go together."

He smiled at me then.

"Very well, Rill," he said. "We'll go together since instead of studying you may be making history. But I go first." And he disappeared cautiously down the steps.

I followed, a foot behind him.

We stood in a small chamber. Our torches cut rings of light on blank walls. The ground was level and firm. There appeared to be no other opening.

Our torches continued to play ahead of us, small pools of light cutting away the darkness. And then I heard the Captain's gasp, felt him stiffen. Following the beam of his torch I too held my breath. For there, slightly off center, lay a long, narrow box.

We moved closer cautiously. Behind us we could hear Trend, the physicist and several others moving down the steps. But our eyes remained glued to the box, or casket, or whatever it was.

The cover was of some strange transparent material. It looked very hard and very solid and encompassed the body of a creature such as I had never seen, or dreamt to see. There was something infinitely deadly about it, something dangerous, threatening in the narrow face. And also something ludicrously fragile about the four narrow stilts that protruded from its frame.

I moved closer and tried to touch the lid. I couldn't. My hand was suddenly, irresistibly, pushed back, my fingers were cold and growing colder. I leaped back a pace.

"Careful, Captain!" I shouted. But my voice, the others told me later, was no more than a husky, frightened whisper in the silence of that terrible room.

The Captain had sprung back also. Now he pressed the blue button on his blaster, and the full power of its deadly energy battered at the object. Nothing happened. Whatever it was, the beam that could disintegrate anything was certainly absorbed and apparently rendered harmless. Not a scratch appeared on the polished surface.

Then the physicist had struck the blaster from the Captain's hand.

"Stop it—!" he shouted.

The Captain's eyes flashed red with anger.

"No use trying," the physicist said breathlessly. "The energy of this field is more powerful than anything our ship has. Nothing we know of can possibly cancel it out. And, after all, why should we try?"

"Why??—" the Captain's voice was raised in scornful astonishment.

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"But it's a monster," I ventured.

"To you, to us, yes. Maybe. But what are we to it?"

I looked at the creature in the oblong casket again.

"If they know so much they may be dangerous," the Captain said. "And it's our duty to destroy them."

"Duty!" the physicist laughed. "They may be enemies—but they might just as well be friends. And with their science, who knows, their power of understanding and tolerance may be greater than ours. And this — monster — isn't dead. It's alive, asleep if you wish, in a state of suspended animation, but protected by all the scientific power of its race. What do you think they would say if ever they come here, and find it destroyed? Don't you think they will hunt us down to the confines of the universe? No—we may not attempt to destroy it."

The physicist stepped forward and stared down at the creature that slept beneath the transparent panel. "Who knows what happened to make it do this? And when will it awaken?" he murmured. "The only clue we have lies in the message. That must be on the wavelength they employed. And we must try to grasp its meaning—"

So we returned to the ship.

The hour was up and we couldn't keep the power without endangering our own possibilities of return. And we had to get back, now more than ever.

We had to return—to wait. And when we died our children would be there, on Halcyon IV, waiting, and their children after them.

Night and day, the sound analysis team worked on that recording. Light years away, back on the planet, the red light continued to send its message across space. Who would be listening? Who would hear it? Who would understand?

Until, one morning, it suddenly became comprehensible. The chaotic noise was subdued, tamed, slowed down until it beat upon our consciousness, a painful, sinister voice, repeating over and over again:

"I am the last — I am the last —s-a-v-e our souls — oh GOD — save our souls — I am the last—"

"An appeal for help, I think, before he went into deep sleep," the physicist said.

We all agreed.

And so it was that we found a companion.

We'll be back soon, on Halcyon IV, with others of our race. We'll wait, no matter how long, until the monster awakens or until others of his race hear his message and come for him.

But sometimes, in the night, I awaken. And I hear that unearthly, mind-shattering voice again, and I shudder, pressing the tips of my tentacles to my head, my antennæ bending inwards as under a heavy gale. And I wonder what will happen when our races meet.

And, more perhaps, I wonder what kind of weapon, or power, "GOD" may be?

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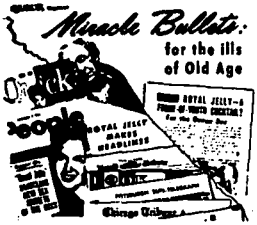
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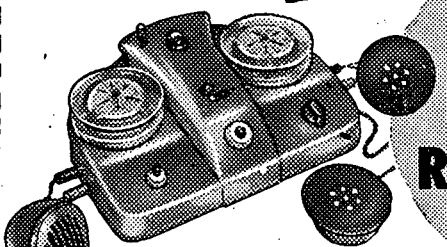

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